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A GUIDE TO MARKS USED FOR TUNAS

AND

AN INVENTORY OF TUNA MARKING PROJECTS

Compiled by

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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C O N T E N T S

INTRODUCTION i

DETACHABLE "MARK" AND "PROGRAM" SHEETS 1

APPENDIXES

I - Questionnaire on Tuna Marking - Parts I and II 77

II Summary Maps for Marking Areas 85

INDEXES

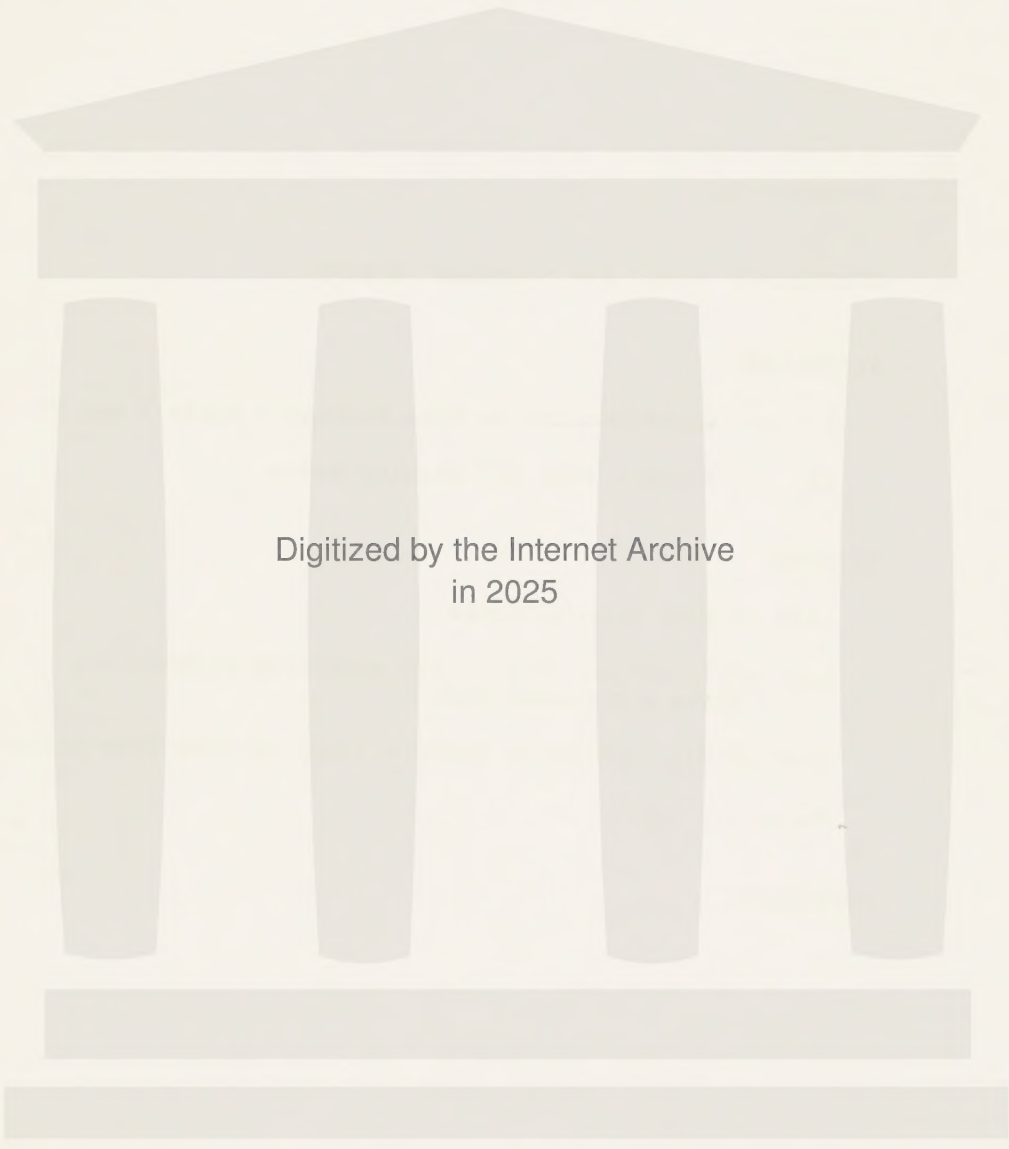
List of Mark Manufacturers 91

List of Principal Offices for receiving particulars of Marks and Marked Fish 93

List of Distinguishing Symbols found on Tuna Fish Marks 95

Taxonomic Index 97

REFERENCES 99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INTRODUCTION

This "Guide" was prepared in response to a recommendation by the FAO Expert Panel for the Facilitation of Tuna Research at its First Session, Rome, 8-12 June 1964. It is a catalogue, the information contained in which is derived from the Questionnaire (Appendix 1) distributed to those agencies conducting research on tunas. In this first stage of preparing this "Guide" no attempt has been made to evaluate the efficiency of the marks, the ways they are applied, and the methods of handling the fish for marking operations. These will be the subject of a paper to be prepared later in which the effectiveness of types of marks and methods of attachment will be discussed.

The "Guide" consists of two parts. The first part is composed of detachable sheets arranged by geographic area. Each sheet has been allocated a five-digit entry number. The first three digits refer to the geographic code used for indexing entries to the Current Bibliography for Aquatic Sciences and Fisheries (ref. Curr.Biblphy Aquat.Sci.Fish., 3(1): Ex 24 - Ex 35); the last two digits identify the agency in the alphabetic order of the title, within a country.

The detachable sheets are each in two groups. The first group entitled "Mark" sheets give illustrated descriptions of marks, their application, methods of handling the fish, kinds of publicity, scale of reward, and reception office(s). At the bottom of each sheet is given the name and address of the manufacturer of the mark. There is one "Mark" sheet for each type of mark used in a country, on which the scientific names of species are displayed on the left-hand side margin to facilitate filing of the sheets by species should this be desired.

The second group of detachable sheets, entitled "Marking Program" give the titles of the programs, cost, sponsoring body(ies), subjects and species studied. The marking area is illustrated on a map on each sheet. In order to give a clear picture of their global distribution, summary maps which include all the marking areas for different species are given in Appendix 2.

The second part of the "Guide" comprises a series of indexes. Although the size of the present version does not in itself justify the preparation of detailed indexes to facilitate retrieval of data shown on the detachable sheets, nevertheless an attempt has been made to prepare a taxonomic index, a list of the manufacturers of tuna marks, a list of the principal offices for receiving particulars of marks and marked fish, and a list of distinguishing letters and serial numbers on tuna marks. These supplementary retrieval aids may establish, on a trial basis, a pattern for the preparation of future catalogues of this kind.

It is hoped eventually to elaborate the "Guide" to make the information more complete and readily usable. The members of the Expert Panel and other recipients of the guide are invited to complete and supplement the information contained in it. Suggestions from users regarding improvement of the format are welcome.

FRs

TUNA MARKS

61501

COUNTRY : Australia

TITLE OF INSTITUTION : CSIRO, Division of Fisheries and Oceanography
P.O. Box 21
Cronulla, N.S.W.

DESCRIPTION

A dart (streamer) tag, made of 12 cm. of yellow or blue plastic tubing, with moulded nylon dart head inserted and glued into one end. It is serially numbered with a letter symbol followed by a five-digit number in the case of the yellow tag, a five-digit number in the case of the blue tag, and legend in black.

*

*

* This was a double tagging program, and fish were tagged with both blue and yellow tags.

APPLICATION

Applicator is made of monel metal tube mounted in a wooden handle of required length. The forward end is slotted to take the stainless steel dart of the tag. Applicator with its enclosed dart tag is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

RECOVERY, REPORTING AND RETURN

Publicity
Audio, visual and audio/visual methods
Direct correspondence/circular letters

Scale of Reward
$A 1.00 per tag

Reception Offices (1) CSIRO, P.O. Box 21, Cronulla, N.S.W.
(2) CSIRO Field Office, c/o Kraft Cannery, Eden, N.S.W.
(3) CSIRO Field Office, Tasman Terrace, Port Lincoln, S.A.
or (4) Any State Fisheries Inspector

Symbols and serial number known to FAO as at June 1966

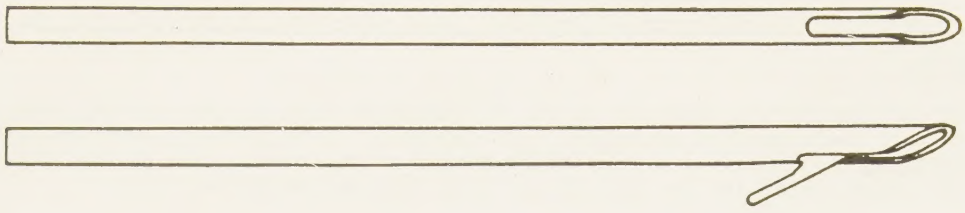
Letter and serial no.	CSIRO CRONULLA AUST. LENGTH.	(Yellow tag)
Serial no.	CSIRO CRONULLA AUST. LENGTH.	(Blue tag)

MANUFACTURER

Plastic Accessories Pty. Ltd.
24 Bowden Street, Alexandria
Sydney, N.S.W.
(darts)

Arthur E. King and Co.
Rear 135 King Street, Newtown
Sydney, N.S.W.
(streamers)

SPECIES MARKED
Thunnus thynnus



FRs TUNA MARKING PROGRAMS

COUNTRY : Australia 61501

TITLE OF INSTITUTION : CSIRO, Division of Fisheries and Oceanography
P.O. Box 21
Cronulla, N.S.W.

TITLE OF PROGRAM: Double Tagging of Bluefin

Current: Indefinite

Projected: - continuing

Estimated annual cost: $A 18,000

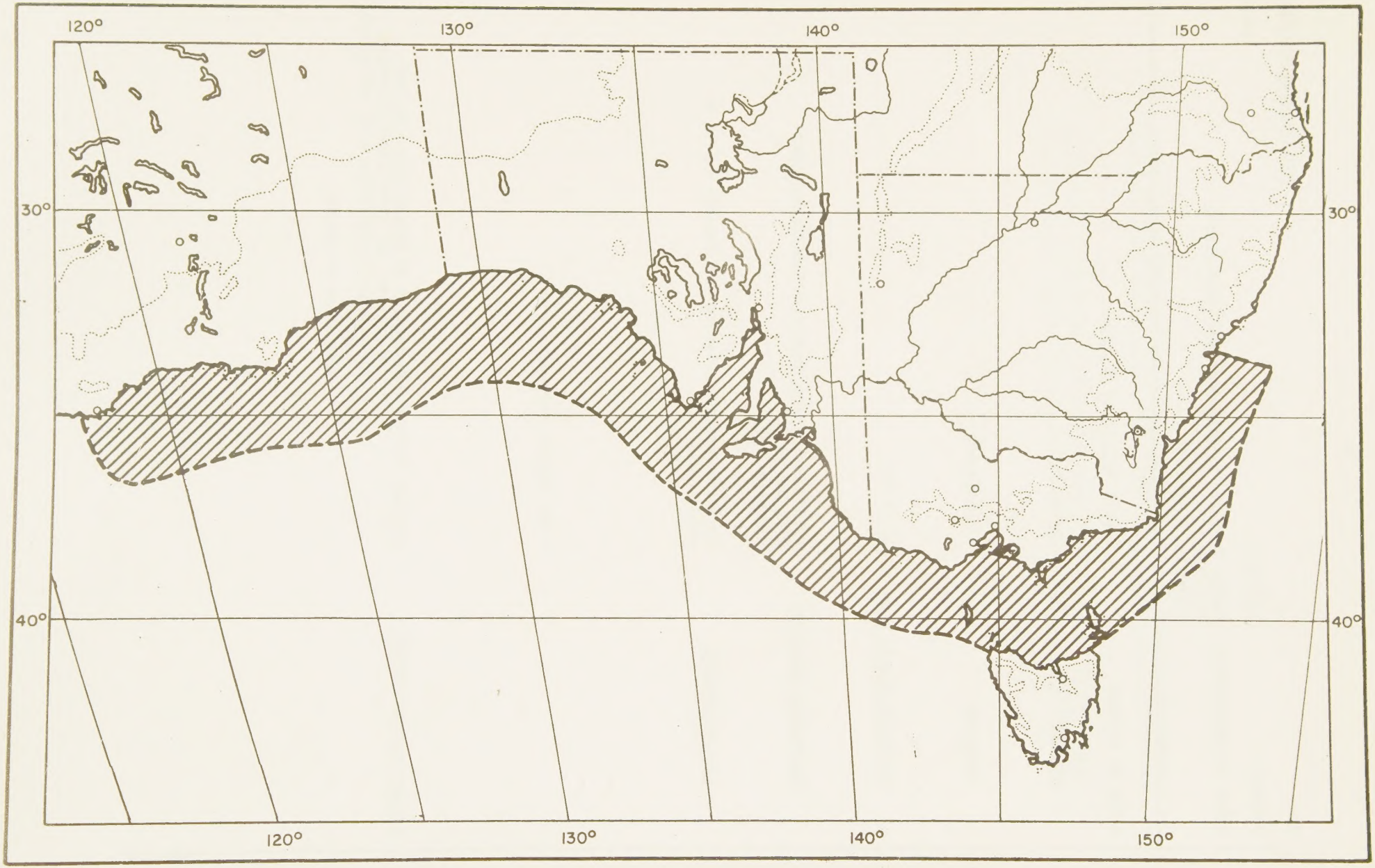
Sponsoring body(ies): CSIRO, Division of Fisheries and Oceanography
P.O. Box 21
Cronulla, N.S.W.

Area of Marking: Southern Australian waters from Sydney, N.S.W. to Albany, W.A.

- See figure overleaf -

SUBJECT MATTER STUDIED: Thunnus thynnus : Estimation of mixing, dispersal and migration, and stock identification.
Estimation of population size and mortality rates.
Estimation of growth.

SPECIES STUDIED
Thunnus thynnus



Coverage of present marking program

FRs TUNA MARKS

COUNTRY : Canada 21701

TITLE OF INSTITUTION : Fisheries Research Board of Canada
Biological Station
St. Andrews, New Brunswick

DESCRIPTION

A dart tag made of 24 cm length of transparent plastic tubing, with moulded nylon dart-head inserted and glued into one end. The transparent tubing contains a 10 cm length of yellow interior tubing, serially numbered with 3 or 5-digit number and legend marked in black ink. The open end of the exterior tubing is sealed with a plug.

APPLICATION

Applicator is made of hollow stainless steel needle mounted in a wooden handle and with a bevelled forward end. Applicator with its enclosed tag is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

RECOVERY, REPORTING AND RETURN

Publicity
Audio methods
Direct correspondence/circular letters

Scale of Reward
$10.00 per tag

Reception Office
Fisheries Research Board of Canada
Biological Station
St. Andrews, N.B.

(or any office of the Minister of Fisheries for forwarding to St. Andrews)

Symbols and serial number known to FAO as at June 1966
Nos. 01001-01500 and 101-300 REWARD $10 FISHERIES RESEARCH CANADA ST. ANDREWS N.B.

MANUFACTURER

Floy Tag Manufacturing Co.
2909 Blakely Street
Seattle 5,
Washington, U.S.A.

SPECIES MARKED
Thunnus thynnus
Thunnus albacares
Thunnus obesus
Euthynnus pelamis
Sarda sarda

FRs TUNA MARKS

COUNTRY : Canada 21701

TITLE OF INSTITUTION : Fisheries Research Board of Canada
Biological Station
St. Andrews, New Brunswick

DESCRIPTION

A dart tag, made of 15½ cm of yellow plastic tubing, with stainless-steel dart-head clamped onto one end. It is serially numbered with a 3 or 5-digit number and legend in black.

APPLICATION

Applicator is made of steel bar mounted in a wooden handle of required length. The forward end is slotted to take the stainless steel dart of the tag. Applicator is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

RECOVERY, REPORTING AND RETURN

Publicity
Audio methods
Direct correspondence/circular letters

Scale of Reward
$10.00 per tag

Reception Office
Fisheries Research Board of Canada
Biological Station
St. Andrews, N.B.

(or any office of the Minister of Fisheries for forwarding to St. Andrews)

Symbols and serial number known to FAO as at June 1966
Nos. 03001-04000 and 301-500 REWARD $10 FBR ST ANDREWS N.B. CANADA

MANUFACTURER

F.C. Philips Inc.
Stoughton
Mass., U.S.A.
(darts)

Pilgrim Plastic Co.
278 Babcock Street
Boston, Mass. 02715, U.S.A.
(messages)

SPECIES MARKED
Thunnus thynnus
Thunnus albacares
Thunnus obesus
Euthynnus pelamis
Sarda sarda

FRs

TUNA MARKS

COUNTRY : Canada

21701

TITLE OF INSTITUTION : Fisheries Research Board of Canada
Biological Station
St. Andrews, New Brunswick

DESCRIPTION

The capsule mark is a moulded nylon tube of $3\frac{1}{2}$ cm connected to a stainless steel dart-head with a 12 cm long monofilament nylon fibre. The capsule contains a letter of instructions and is sealed with a red screw-in plug. The accurate fittings result in a virtually water-tight capsule.

APPLICATION

Applicator is made of steel bar mounted in a wooden handle of required length. The forward end is slotted to take the stainless steel dart of the tag. Applicator is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

RECOVERY, REPORTING AND RETURN

Publicity
Audio methods
Direct correspondence/circular letters

Scale of Reward
$10.00 per tag

Reception Office
Fisheries Research Board of Canada
Biological Station
St. Andrews, N.B.

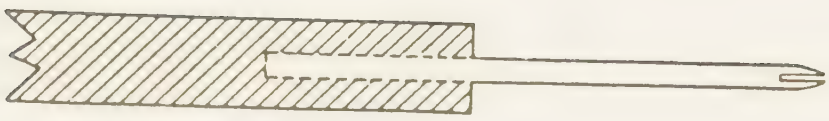
(or any office of the Minister of Fisheries for forwarding to St. Andrews)

Symbols and serial number known to FAO as at June 1966
A.1001 to A.6000

SPECIES MARKED
Thunnus thynnus
Thunnus albacares
Thunnus obesus

MANUFACTURER

F.C. Philips Inc.
Stoughton
Mass.
U.S.A.



FRs TUNA MARKING PROGRAMS

COUNTRY : Canada 21701

TITLE OF INSTITUTION : Fisheries Research Board of Canada
Biological Station
St. Andrews, New Brunswick

TITLE OF PROGRAM Longlined Tuna

Current Year long 1964 and 1965

Projected - continuing

Estimated annual cost -

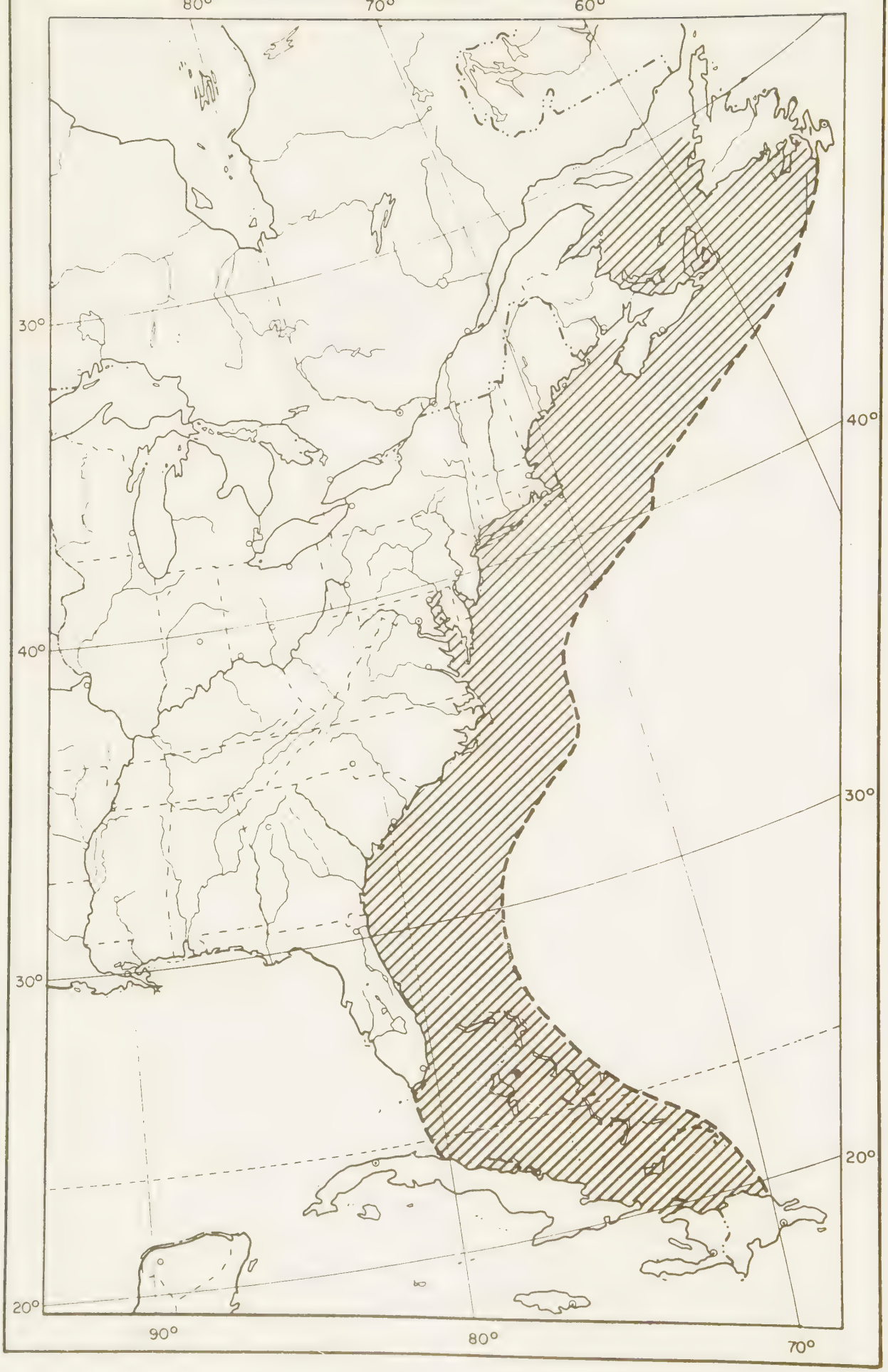
Sponsoring body(ies) Fisheries Research Board of Canada

Area of Marking N.W. Atlantic (Caribbean to Newfoundland)

- See figure overleaf -

SPECIES STUDIED

Thunnus thynnus	SUBJECT MATTER STUDIED : Estimation of mixing, dispersal and migration, and stock identification.
Thunnus albacares	- do -
Thunnus obesus	- do -



Coverage of present

FRs TUNA MARKING PROGRAMS

COUNTRY : Canada 21701

TITLE OF INSTITUTION : Fisheries Research Board of Canada
Biological Station
St. Andrews, New Brunswick

TITLE OF PROGRAM "Giant" (Nova Scotia) Bluefin tagging

Current July-August 1963, 1964 and 1965

Projected - long-term, continuing

Estimated annual cost $ 2,000

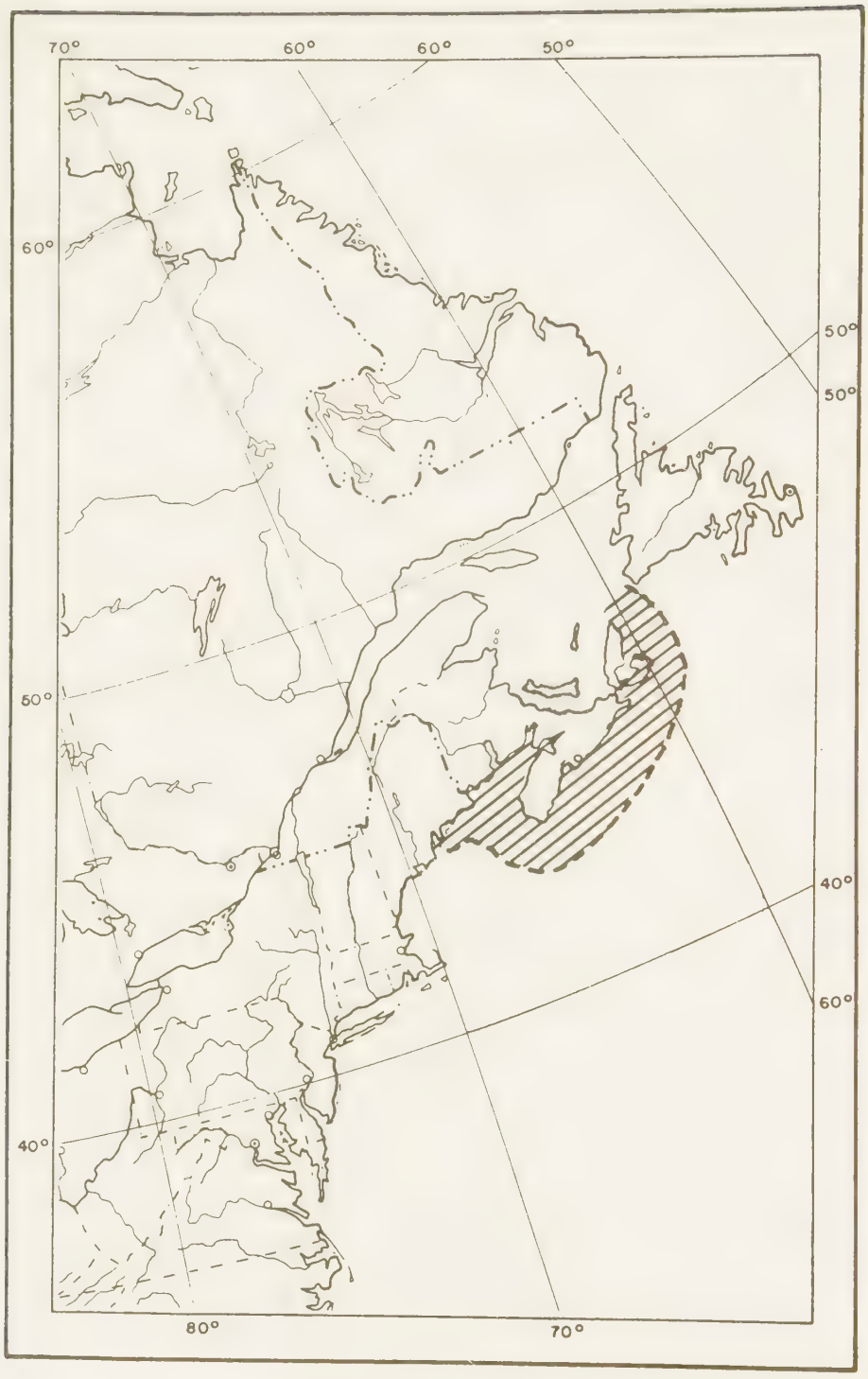
Sponsoring body(ies) Fisheries Research Board of Canada

Area of Marking St. Margaret's Bay, N.S., proposed extension to Yarmouth Country, N.S.

- See figure overleaf -

SUBJECT MATTER STUDIED Thunnus thynnus : Estimation of mixing, dispersal and migration, and stock identification.
Estimation of growth.

SPECIES STUDIED
Thunnus thynnus



Coverage of present marking program

FRs TUNA MARKING PROGRAMS

COUNTRY : Canada 21701

TITLE OF INSTITUTION : Fisheries Research Board of Canada
Biological Station
St. Andrews, New Brunswick

TITLE OF PROGRAM Purse Seine Tuna

Current July-September 1964 and 1965

Projected - continuing

Estimated annual cost -

Sponsoring body(ies) Fisheries Research Board of Canada

Area of Marking Continental shelf off Virginia to Massachusetts, USA

- See figure overleaf -

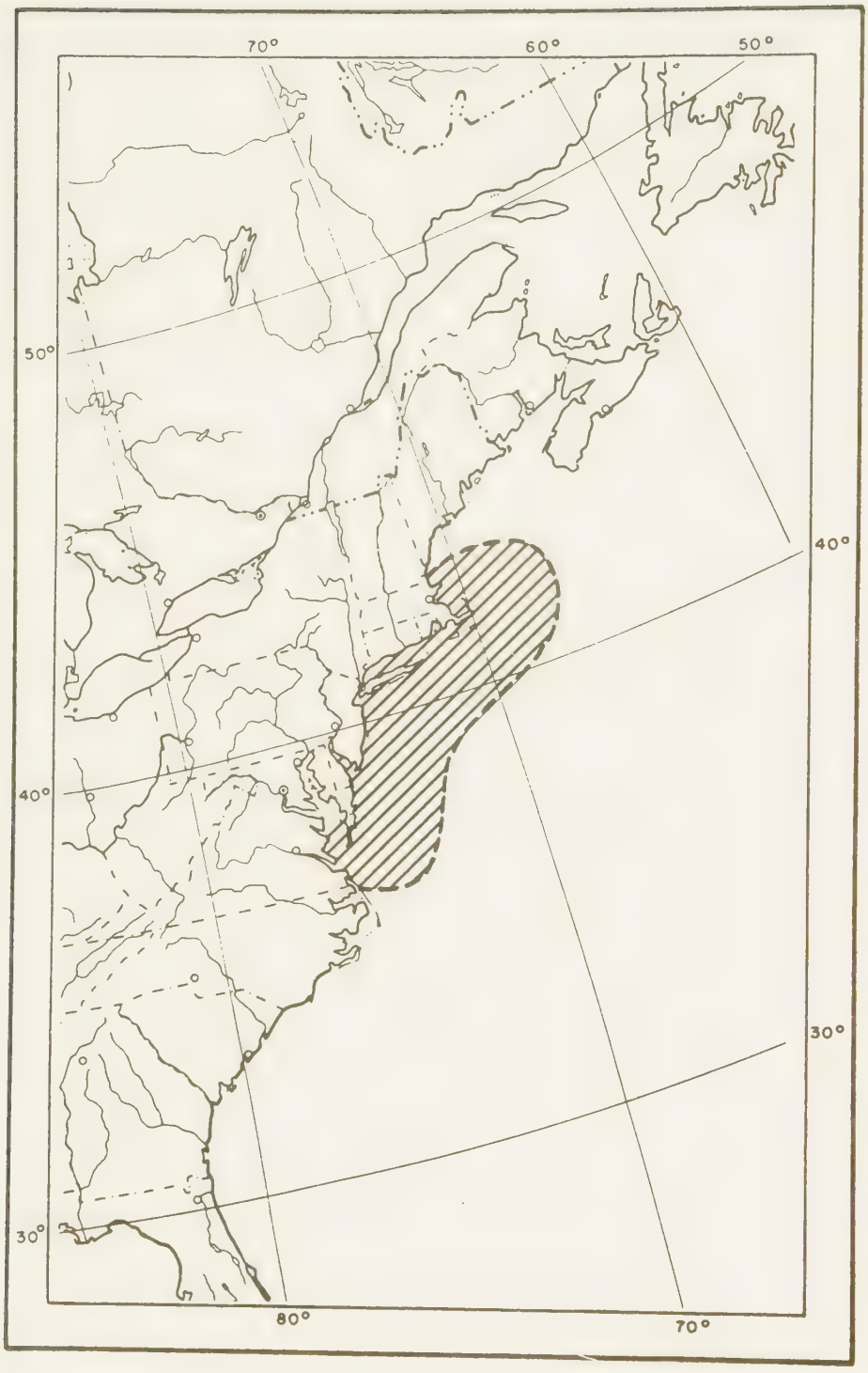
SUBJECT MATTER STUDIED

Thunnus thynnus : Estimation of mixing, dispersal and migration, and stock identification.
Estimation of population size and mortality rates.
Estimation of growth.

Euthynnus pelamis : - do -

Sarda sarda : Estimation of mixing, dispersal and migration.

SPECIES STUDIED
Thunnus thynnus
Euthynnus pelamis
Sarda sarda



Coverage of present marking program

FRs

TUNA MARKS

COUNTRY : Italy

54301

TITLE OF INSTITUTION : Centro Sperimentale per l'Industria della Pesca e dei Prodotti del Mare
Via Garibaldi 136, Messina

DESCRIPTION

A dart tag made of 18½ cm. of yellow plastic tubing, with moulded nylon dart head inserted and glued into one end. It is serially numbered with a letter symbol, 4-digit number and legend in black.

APPLICATION

Applicator is made of hollow stainless steel needle, O.D. 5 mm, with bevelled end. Applicator with its enclosed dart tag is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

Fish are held in a V-shaped trough made of plywood. The insides of the trough are lined with sponge rubber. The rubber is covered with plastic sheeting. Inset in one side of the trough is a meter stick.

- See figure overleaf -

Thunnus alalunga

RECOVERY, REPORTING AND RETURN

Publicity
Visual methods
Direct correspondence/circular letters

Scale of Reward
Letter of thanks

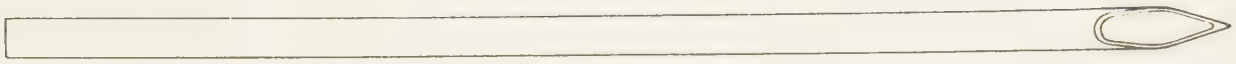
Reception Office
Centro Sperimentale per l'Industria della Pesca, Sezione Scientifica
Via Garibaldi 136
Messina

Symbols and serial number known to FAO as at June 1966
Letter, serial no. CENTRO SPERIMENTALE PESCA - MESSINA - ITALY

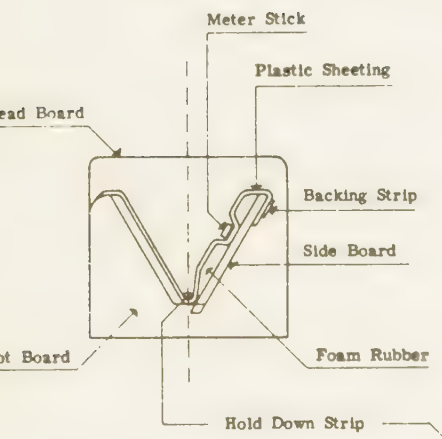
SPECIES MARKED
Thunnus thynnus

MANUFACTURER

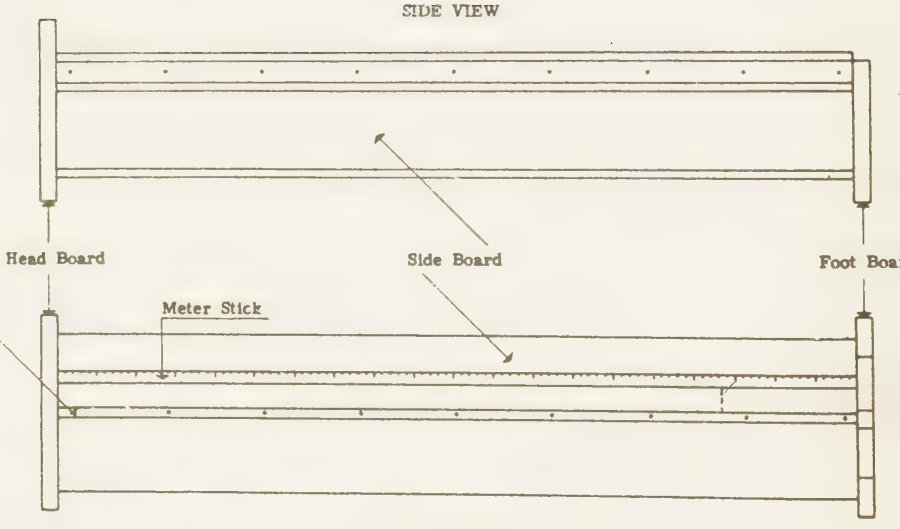
INSUL-TAB Co. Inc.
160 Cross Street
Winchester, Mass.
U.S.A.



END VIEW



SIDE VIEW



TOP VIEW

FRs

TUNA MARKING PROGRAMS

COUNTRY : Italy

54301

TITLE OF INSTITUTION : Centro Sperimentale per l'Industria della Pesca e dei Prodotti del Mare
Via Garibaldi 136, Messina

TITLE OF PROGRAM	PROSECUZIONE DELLA CAMPAGNA DI MARCATURE DEI GIOVANI TONNI, TONNIDI E PESCI-SPADA
Current	-
Projected	1 - 31 October 1966
Estimated annual cost	$4,000
Sponsoring body(ies)	Assessorato Industria e Commercio della Regione Siciliana
Area of Marking	Tyrhenian Sea and Ionian Sea

- See figure overleaf -

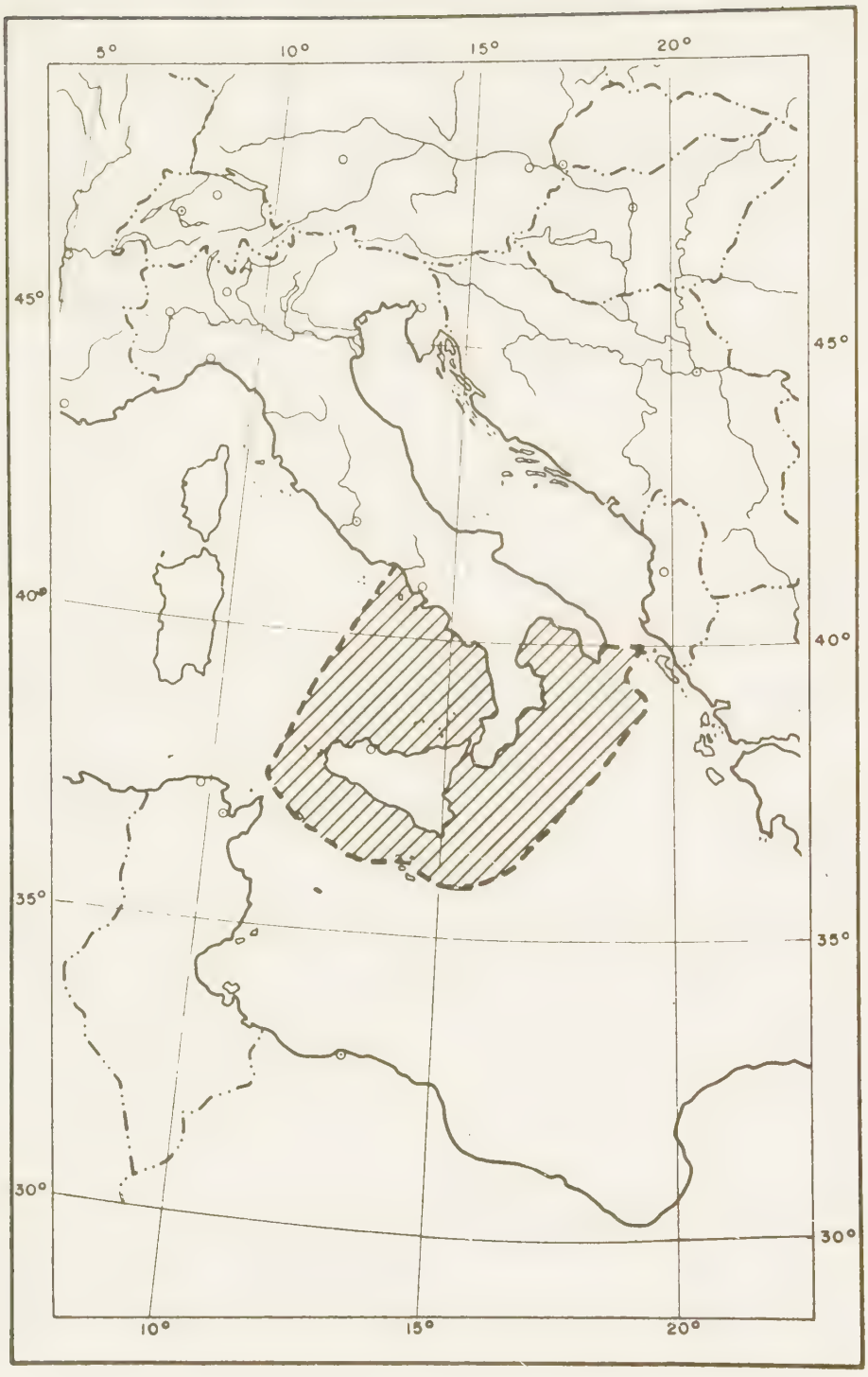
SPECIES STUDIED

Thunnus thynnus

Thunnus alalunga

SUBJECT MATTER STUDIED

Thunnus thynnus	:	Estimation of mixing, dispersal and migration, and stock identification Estimation of population size and mortality rates Estimation of growth
Thunnus alalunga		Estimation of mixing, dispersal and migration Estimation of growth


5°
10°
15°
20°
45°
40°
35°
30°

FRs

TUNA MARKS

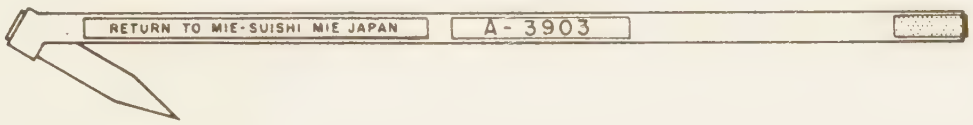
COUNTRY : Japan

45101

TITLE OF INSTITUTION : Mie Prefectural Fishery Experimental Station
Hamajima-cho, Shima-Gun
Mie-ken, Japan

DESCRIPTION

A dart tag, made of 7½ cm of transparent polythene tubing, with moulded nylon dart-head inserted at one end. The transparent tubing contains a message in black on pink paper, and an inner small piece of white plastic tubing with letter symbol followed by a 4-digit serial number in black. The tag is sealed with a plug at the open end of the exterior tubing.



Euthynnus pelamis

APPLICATION

Applicator is made of hollow stainless steel needle, with bevelled forward end. Applicator with its enclosed dart tag is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

Thunnus alalunga

RECOVERY, REPORTING AND RETURN

Publicity
Visual methods

Scale of Reward
Letter of thanks

Reception Office
Mie Prefectural Fishery Experimental Station
Hamajima-cho, Shima-Gun, Mie-ken

Symbols and serial number known to FAO as at June 1966
Letter, serial no. RETURN TO MIE-SUICHI, MIE, JAPAN

SPECIES MARKED

MANUFACTURER

Mie Prefectural Fishery Experimental Station
Hamajima-cho, Shima-Gun, Mie-ken

FRs TUNA MARKING PROGRAMS

COUNTRY : Japan 45101

TITLE OF INSTITUTION : Mie Prefectural Fishery Experimental Station
Hamajima-cho, Shima-Gun
Mie-ken, Japan

TITLE OF PROGRAM -

Current All the year round

Projected -

Estimated annual cost -

Sponsoring body(ies) -

Area of Marking Japan Sea and west area of Maliana Islands

- See figure overleaf -

SPECIES STUDIED

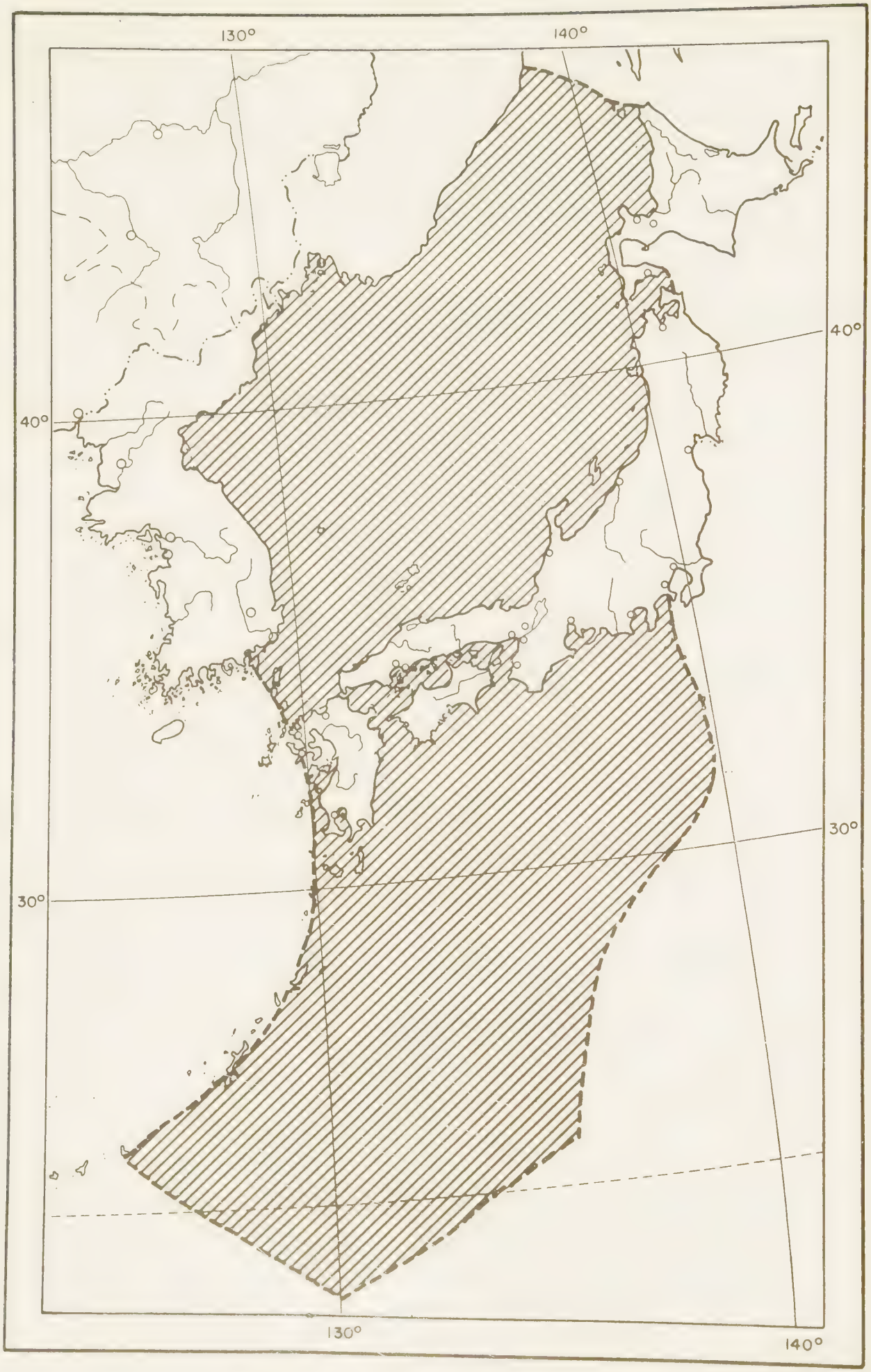
Thunnus alalunga

Euthynnus pelamis

SUBJECT MATTER STUDIED

Thunnus alalunga : Estimation of mixing, dispersal and migration

Euthynnus pelamis : - do -



Coverage of present marking program

FRs

TUNA MARKS

COUNTRY : Japan 45102

TITLE OF INSTITUTION : Nankai Regional Fisheries Research Laboratory
6-chome, Sanbashi-dori
Kochi shi

DESCRIPTION

A dart tag, made of 16 cm. of yellow plastic tubing with yellow moulded nylon dart-head inserted and glued into one end. It is serially numbered with a letter symbol followed by a four-digit number and legend in black.

Euthynnus pelamis

APPLICATION

Applicator is made of hollow stainless steel needle, with bevelled forward end. Applicator with its enclosed dart tag is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

Fish are held in a V-shaped cradle made of aluminium alloy. The insides of the cradle are covered with sponge rubber which is, in turn, covered by plastic sheeting. Inset in one side of the cradle is a meter stick. A tag magazine, to hold 100 tag needles, and dart tags, is bolted to the cradle.

- See figure overleaf -

Thunnus alalunga

RECOVERY, REPORTING AND RETURN

Publicity
Visual methods

Thunnus obesus

Scale of Reward
Gift (fountain pen) and commendation letter

Reception Office
Nankai Regional Fisheries Research Laboratory
Fishery Agency, Japanese Government
6-chome, Sanbashi-dori, Kochi-shi, Japan

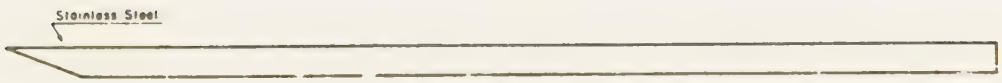
Thunnus albacares

Symbols and serial number known to FAO as at June 1966
Letter, serial no. NANKAI-SUIKEN KOCHI JAPAN A

SPECIES MARKED

MANUFACTURER

Takano-seisakujo
22 Nijyudaibashi-dori
Kochi-shi
Japan



NEEDLE

FRs

TUNA MARKING PROGRAMS

COUNTRY : Japan

45102

TITLE OF INSTITUTION : Nankai Regional Fisheries Research Laboratory
6-chome, Sanbashi-dori
Kochi-shi

TITLE OF PROGRAM: Yellowfin Tagging Project in the Western Tropical Pacific

Current: -

Projected: Period not yet decided - expected to start in a few years

Estimated annual cost: $ 500,000 for first year, and $300,000 for second year and after

Sponsoring body(ies): Fishery Agency, Japanese Government, in co-operation with foreign governments and international organizations

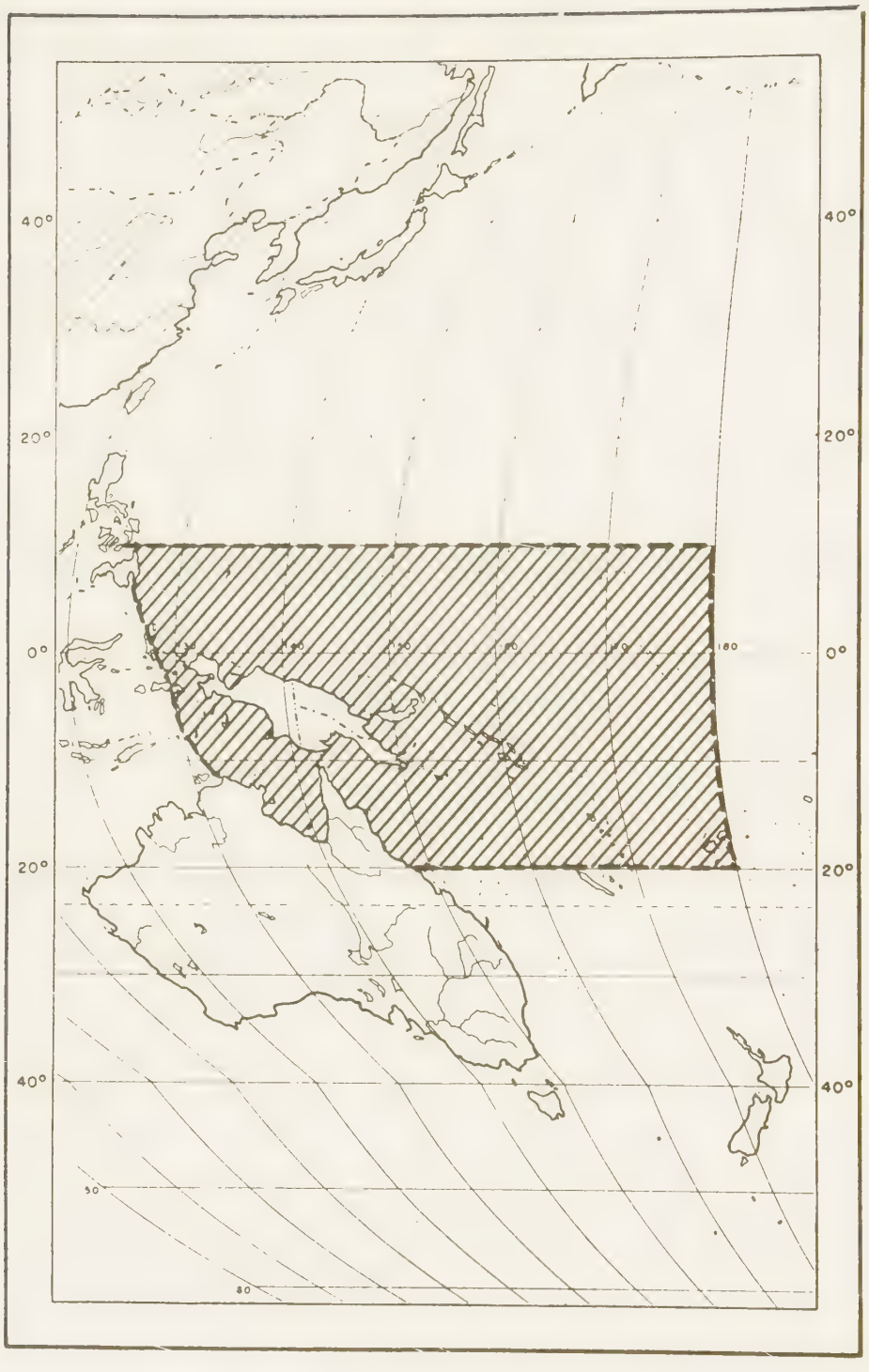
Area of Marking: 10° N-20°S, West of 180°

- See figure overleaf -

SUBJECT MATTER STUDIED

Thunnus albacares : Estimation of mixing, dispersal and migration, and stock identification
Estimation of population size and mortality rates
Estimation of growth

SPECIES STUDIED
Thunnus albacares



Coverage of present marking program

FRs

TUNA MARKS

COUNTRY : Japan

45103

TITLE OF INSTITUTION : Fisheries Research Laboratory
Faculty of Oceanography
Tokai University, 1000 Orido Shimizushi

DESCRIPTION

A dart tag, made of 16 cm of yellow plastic tubing with moulded nylon dart-head inserted and glued into one end. It is serially numbered with a letter symbol followed by a four-digit number, marked in black.

APPLICATION

Applicator is made of hollow stainless steel needle, with bevelled forward end. Applicator with its enclosed dart-tag is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

Marking is carried out by three persons, one of whom holds fish under his left arm, the second person measures length and the third applies the dart to the fish under the second dorsal fin.

RECOVERY, REPORTING AND RETURN

Publicity

Visual and audio methods

Scale of Reward

-

Reception Office

-

Symbols and serial number known to FAO as at June 1966

SPECIES MARKED

Euthynnus pelamis

Thunnus alalunga

Thunnus obesus

Thunnus albacares

MANUFACTURER

Tags provided by Nankai Regional Fisheries Research Laboratory and Tohoku Regional Fisheries Research Laboratory.

FRs

TUNA MARKING PROGRAMS

COUNTRY : Japan

45103

TITLE OF INSTITUTION : Nankai Regional Fisheries Research Laboratory
6-chome, Sanbashi-dori, Kochi-shi, Japan
(Program carried out on behalf of Tokai University)

TITLE OF PROGRAM: Migration and Oceanographic conditions in the South Western Pacific.

Current: From August 1965 to March 1966

Projected:

Estimated annual cost:

Sponsoring body(ies):

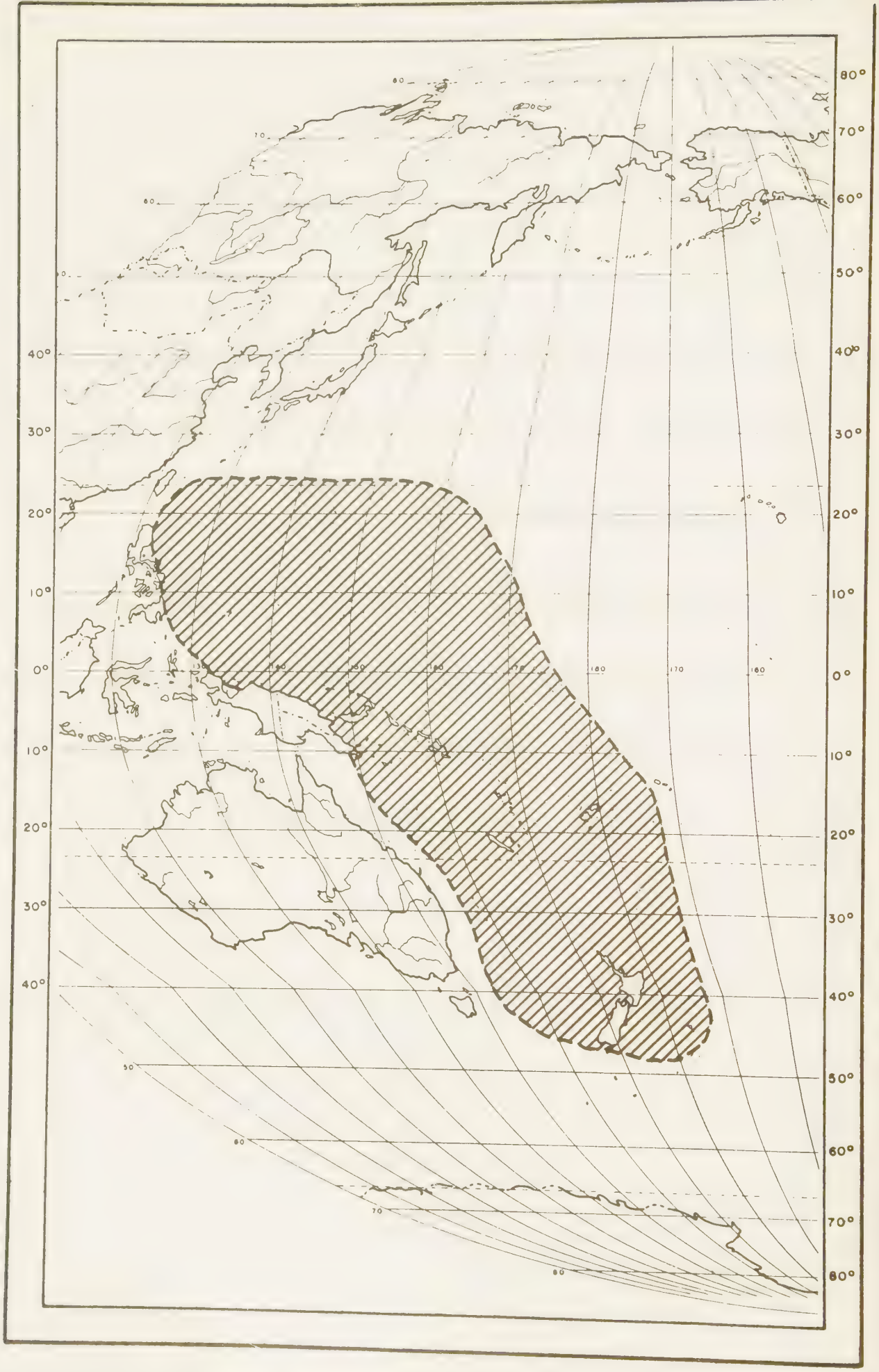
Area of Marking: Southwestern Pacific.

- See figure overleaf -

SUBJECT MATTER STUDIED

Thunnus albacares Thunnus obesus Thunnus alalunga Euthynnus pelamis	: Estimation of mixing, dispersal and migration. Estimation of growth.

SPECIES STUDIED
Thunnus albacares
Thunnus obesus
Thunnus alalunga
Euthynnus pelamis



Coverage of present marking program

FRs

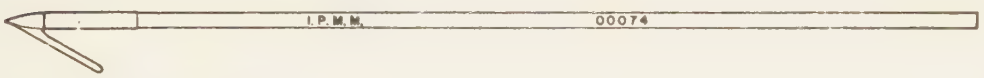
TUNA MARKS

COUNTRY : Morocco 11301

TITLE OF INSTITUTION : Institut des Pêches Maritimes au Maroc
Rue de Tiznit
Casablanca

DESCRIPTION

A dart tag, made of 15 cm of yellow plastic tubing, with moulded nylon dart-head inserted and glued into one end. It is serially numbered with a 5-digit number and the letters I.P.M.M. marked in black.



Euthynnus pelamis

APPLICATION[1]

Applicator is made of hollow stainless steel needle, with bevelled forward end. Applicator with its enclosed dart tag is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

Thunnus alalunga

RECOVERY, REPORTING AND RETURN

Publicity
Direct correspondence/circulars

Scale of Reward
None

Reception Office
Institut des Pêches Maritimes
Rue de Tiznit
Casablanca

Symbols and serial number known to FAO as at June 1966
Serial no. I.P.M.M.

SPECIES MARKED
Thunnus thynnus

MANUFACTURER

Tags ordered from U.S.A. by the agent of Damidoy of Casablanca

FRs

TUNA MARKING PROGRAMS

COUNTRY : Morocco

11301

TITLE OF INSTITUTION : Institut des Peches Maritimes au Maroc
Rue de Tuznit
Casablanca

TITLE OF PROGRAM -

Current -

Projected Summer/Autumn 1966

Estimated annual cost No payments or indemnities. Marking will be done during normal cruises of the pilot boats.

Sponsoring body(ies)

Area of Marking Atlantic coast of Morocco between 5 and 30 miles off the coast.

- See figure overleaf -

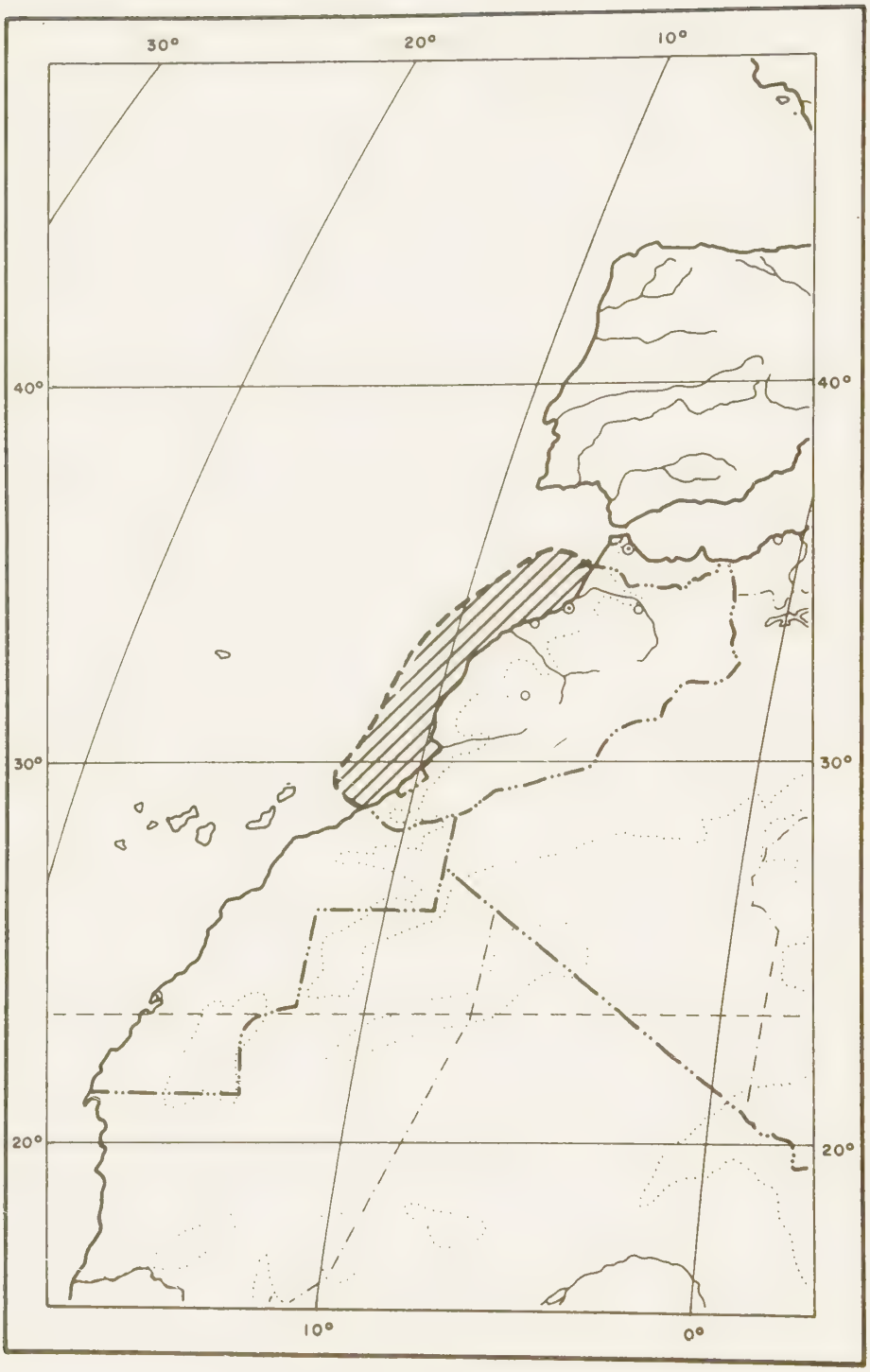
SUBJECT MATTER STUDIED

Thunnus thynnus : Estimation of mixing dispersal and migration.
Estimation of population size and mortality rates.
Estimation of growth.

Thunnus alalunga : - do -

Euthynnus pelamis : - do -

SPECIES STUDIED
Thunnus thynnus
Thunnus alalunga
Euthynnus pelamis



Coverage of present marking program

FRs

TUNA MARKS

COUNTRY : Norway

51401

TITLE OF INSTITUTION : Directorate of Fisheries
Institute of Marine Research
Nordnesparken 2, Bergen

DESCRIPTION

A Lea hydrostatic tag, consisting of a water-tight tube of plastic, coloured yellow and blue, containing a letter of instructions. It is attached to a nylon dart head by about 6 cm of monofilament nylon fibre.

APPLICATION

Applicator is made of steel bar mounted in a wooden handle of required length. The forward end of the bar is pointed into a tenon to fit into the mortise of the dart. Applicator is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

RECOVERY, REPORTING AND RETURN

Publicity
Visual and audio methods

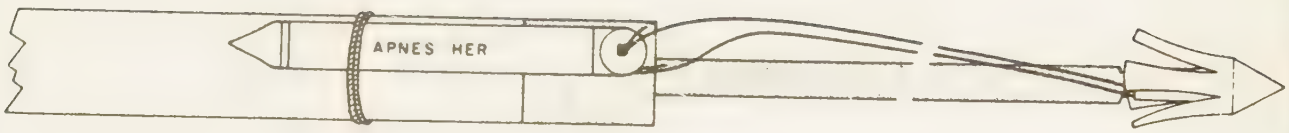
Scale of Reward
$ 3,50

Reception Office
Fiskeridirectoratets
Bergen, Norway

Symbols and serial number known to FAO as at June 1966

MANUFACTURER
Norsk Plastic A/S
Fredrikstad, Norway

SPECIES MARKED
Thunnus thynnus


APNES HER

FRs

TUNA MARKS

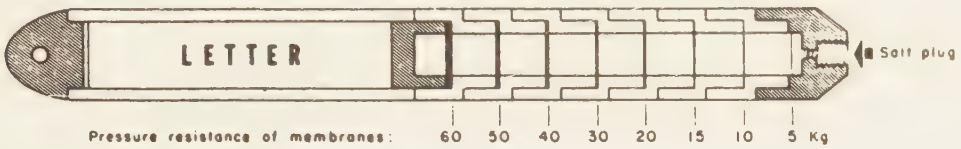
COUNTRY : Norway

51401

TITLE OF INSTITUTION : Directorate of Fisheries
Institute of Marine Research
Nordnesparken 2, Bergen

DESCRIPTION

A depth recording mark entitled "Tapeworm tag" is being constructed, consisting of a water-tight segment to contain letter of instructions and eight pressure segments separated by membranes designed to resist pressures of 5 to 60 kg. It is to be attached to the body of the fish as with the Lea type tag.



APPLICATION

Applicator is made of steel bar mounted in a wooden handle of required length. The forward end of the bar is pointed into a tenon to fit into the mortise of the dart. Applicator is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

RECOVERY, REPORTING AND RETURN

Publicity
Visual and audio methods

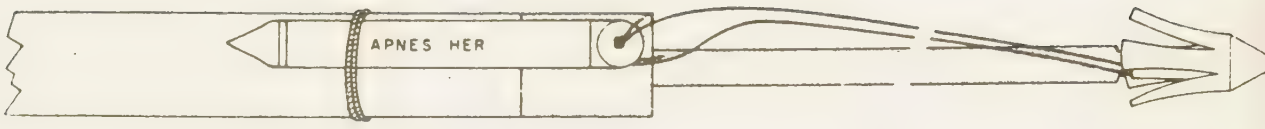
Scale of Reward
$ 3,50

Reception Office
Fiskeridirectoratet
Bergen, Norway

Symbols and serial number known to FAO as at June 1966

MANUFACTURER
Norsk Plastic A/S
Fredrikstad, Norway

SPECIES MARKED
Thunnus thynnus


APNES HER

FRs TUNA LARKING PROGRALS

COUNTRY : Norway 51401

TITLE OF INSTITUTION : Directorate of Fisheries
Institute of Marine Research
Nordnesparken 2, Bergen

TITLE OF PROGRAM Tuna tagging

Current 1957-62

Projected

Estimated annual cost $2000,-

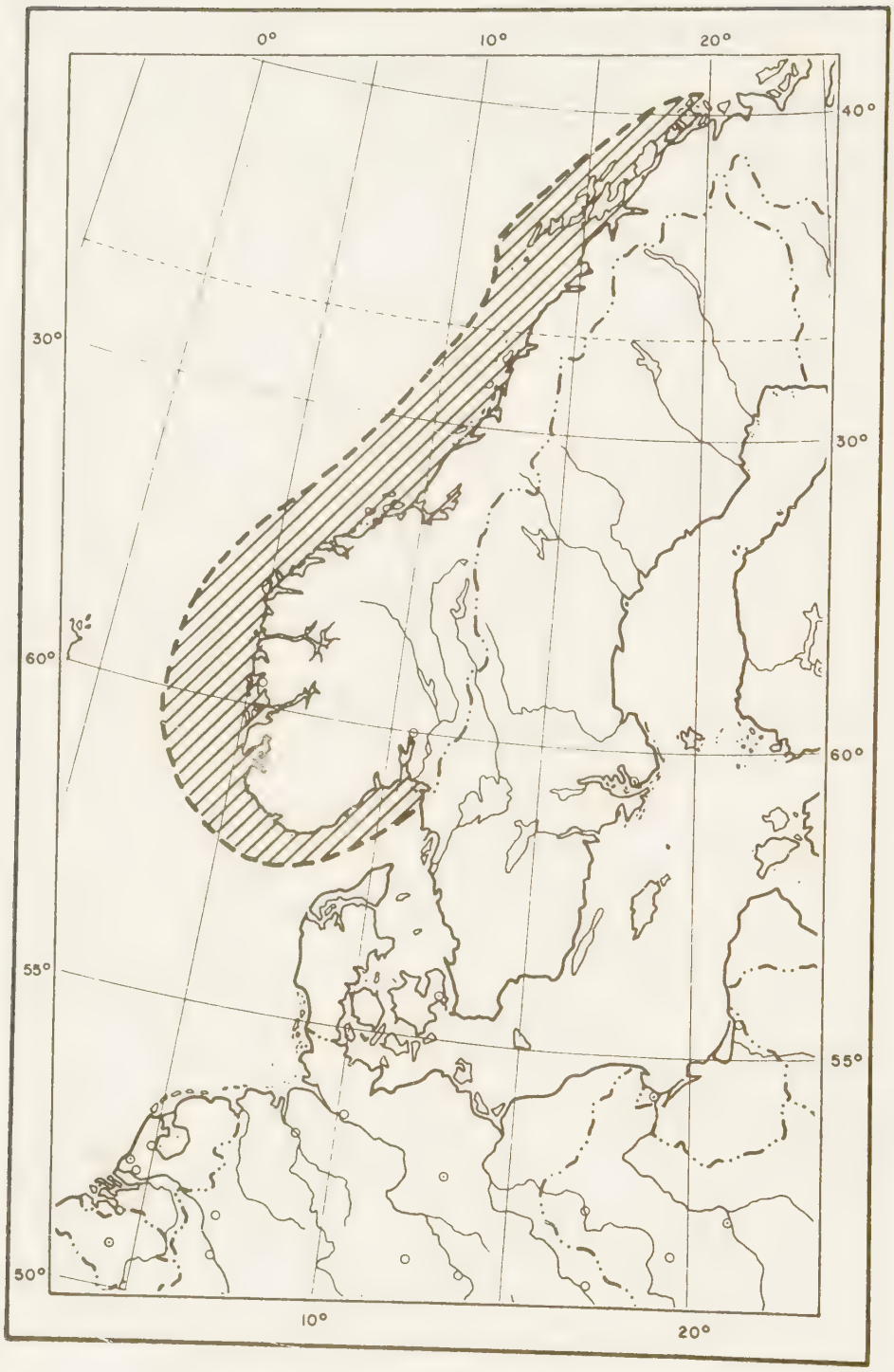
Sponsoring body(ies) Norwegian Institute of Marine Research

Area of Marking Norwegian coast

- See figure overleaf -

SUBJECT MATTER STUDIED Thunnus thynnus : Estimation of mixing, dispersal and migration, and stock identification

SPECIES STUDIED
Thunnus thynnus



Coverage of present marking program

FRs

TUNA MARKS

COUNTRY : Portugal

54101

TITLE OF INSTITUTION : Instituto de Biologia Maritima
Cais do Sodré
Lisboa 2

DESCRIPTION

The mark consists of a yellow alkathene sheet of 15 x 4 cm on which the letter of instructions is printed in black water-proof ink. The alkathene sheet is wrapped onto a blue alkathene spool of 55 mm long which is connected to a nylon dart head with an 8 cm long monofilament nylon fibre.

APPLICATION

Applicator is made of steel bar mounted in a wooden handle of required length. The forward end of the bar is pointed into a tenon to fit into the mortise of the dart. Applicator is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

RECOVERY, REPORTING AND RETURN

Publicity
Audio and visual methods
Direct correspondence/circular letters

Scale of Reward
$2

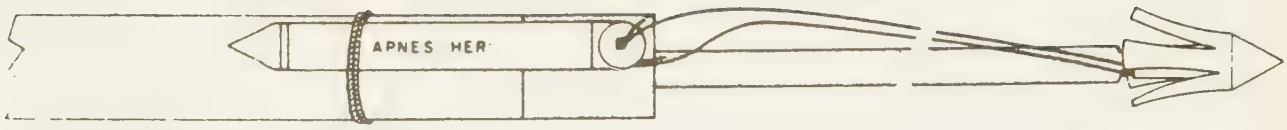
Reception Office
Instituto de Biologia Maritima
Cais do Sodré
Lisboa 2, Portugal

Symbols and serial number known to FAO as at June 1966

MANUFACTURER

(Tags obtained through the Institute of Marine Research, Bergen, Norway)

SPECIES MARKED
Thunnus thynnus


APNES HER

FRs

TUNA MARKING PROGRAMS

54101

COUNTRY : Portugal

TITLE OF INSTITUTION : Instituto de Biologia Maritima
Cais do Sodré
Lisboa 2

TITLE OF PROGRAM: Tuna tagging

Current: Autumn

Projected: May to July 1967

Estimated annual cost: Not yet determined

Sponsoring body(ies): Instituto de Biologia Maritima

Area of Marking:

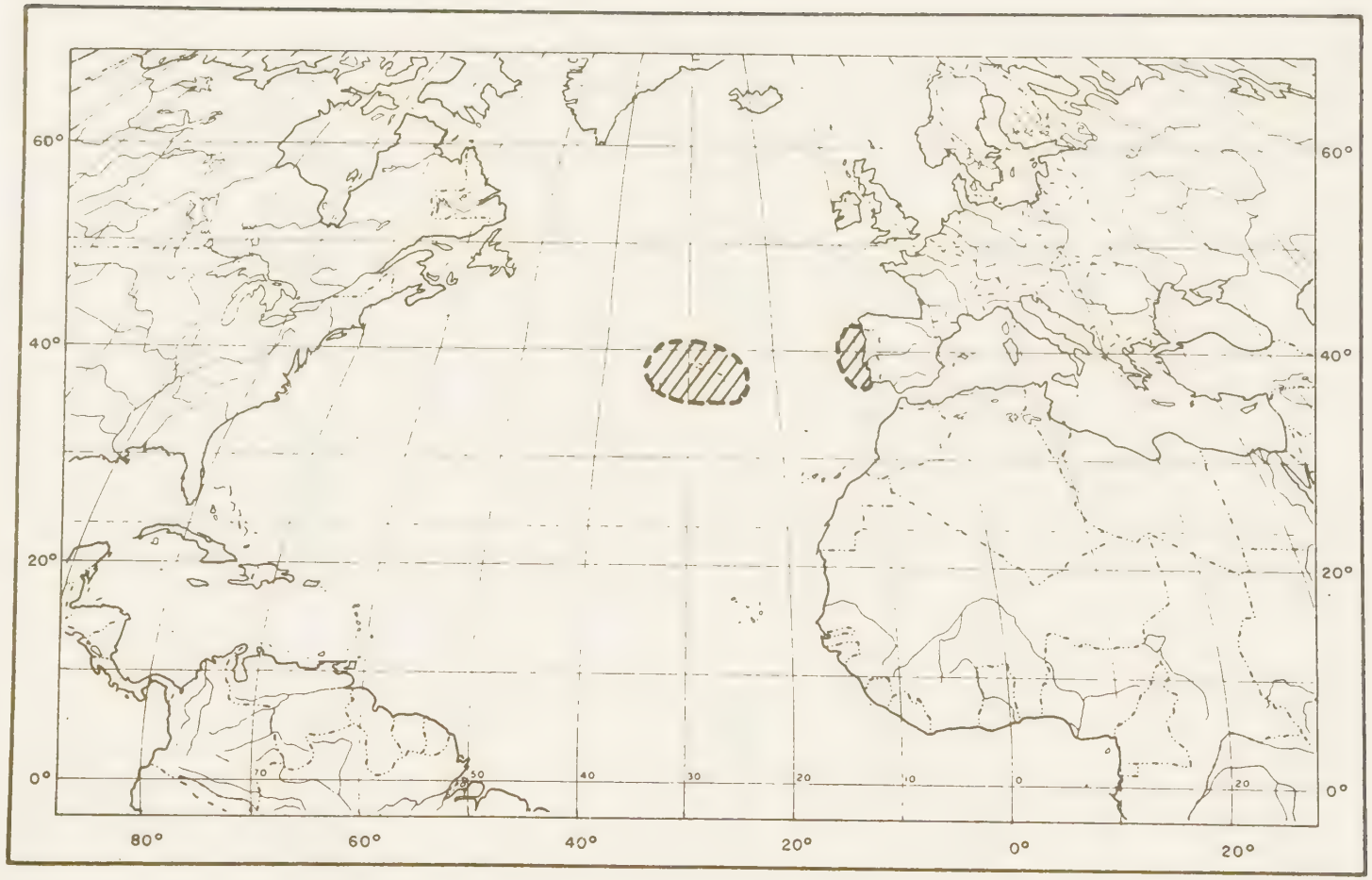
Autumn	Portuguese west coast (near Sesimbra)
May to July 1967	Azores islands

- See figure overleaf -

SUBJECT MATTER STUDIED

Thunnus thynnus (Portuguese west coast)	Estimation of mixing, dispersal and migration, and stock identification Estimation of population size and mortality rates
Thunnus obesus (S. Miguel, Azores islands)	- do -

SPECIES STUDIED
Thunnus thynnus
Thunnus obesus



Coverage of present marking program

FRs

TUNA MARKS

COUNTRY : Spain

54201

TITLE OF INSTITUTION : Instituto de Investigaciones Pesqueras
Puerto Pesquero
Cádiz, Spain

DESCRIPTION

A water-tight tube, 8 cm. long, of transparent plastic, containing a blue and yellow coloured instruction leaflet. This is joined by a monofilament nylon thread to a stainless steel dart-head. The mark is serially numbered with a letter symbol and a one-digit number in black marked on the instruction leaflet.

APPLICATION

Applicator is made of steel bar mounted in a wooden handle of required length. The forward end of the bar is pointed into a tenon to fit into the mortise of the dart. Applicator is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

Wooden trough marked in 10 cm intervals - hung overboard during marking operation - onto which the fish is hoisted. The length measurement and marking operation are carried out simultaneously.

- See figure overleaf -

RECOVERY, REPORTING AND RETURN

Publicity
Circular letter

Scale of Reward
$ 2½

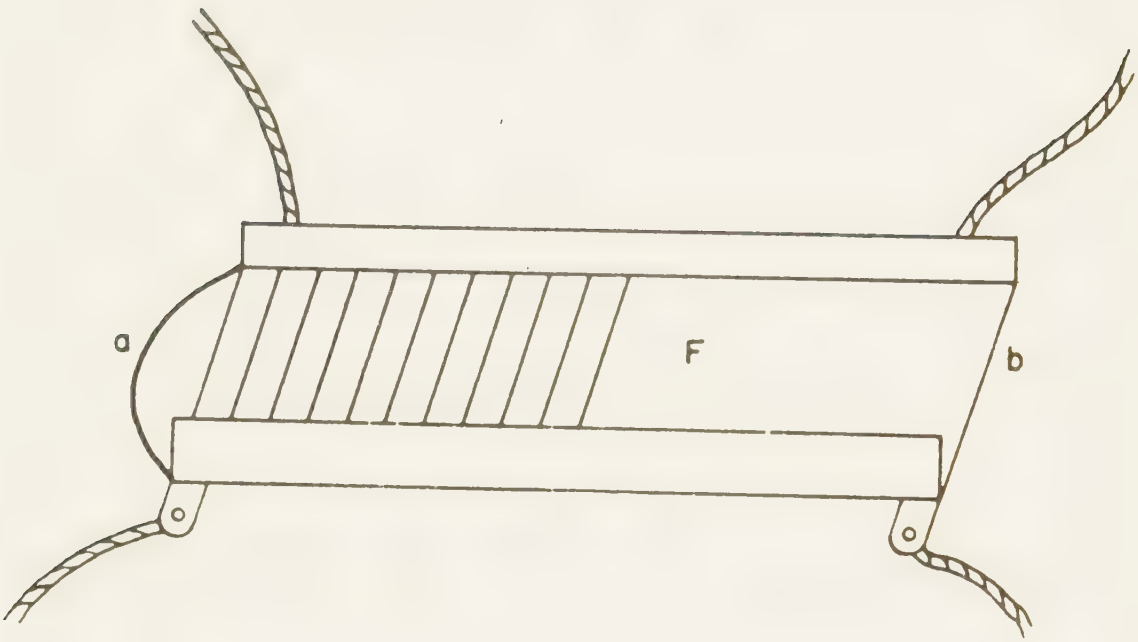
Reception Office
Instituto de Investigaciones Pesqueras
Puerto Pesquero
Cádiz, Spain

Symbols and serial number known to FAO as at June 1966
Letter, serial no.

MANUFACTURER

Instituto de Investigaciones Pesqueras
Puerto Pesquero
Cádiz, Spain

SPECIES MARKED
Thunnus thynnus


a
F
b

FRs

TUNA MARKS

COUNTRY : Spain

54201

TITLE OF INSTITUTION : Instituto de Investigaciones Pesqueras
Puerto Pesquero
Cádiz, Spain

DESCRIPTION

A water-tight tube, 8 cm. long, of transparent plastic, containing a blue and yellow coloured instruction leaflet. This is joined by a monofilament nylon thread to a nylon dart-head. The mark is serially numbered with a two-digit number in black marked on the instruction leaflet.

APPLICATION

Applicator is made of steel bar mounted in a wooden handle of required length. The forward end of the bar is pointed into a tenon to fit into the mortise of the dart. Applicator is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

Wooden trough marked in 10 cm intervals - hung overboard during marking operation - onto which the fish is hoisted. The length measurement and marking operation are carried out simultaneously.

- See figure overleaf -

RECOVERY, REPORTING AND RETURN

Publicity
Circular letter

Scale of Reward
$ 2½

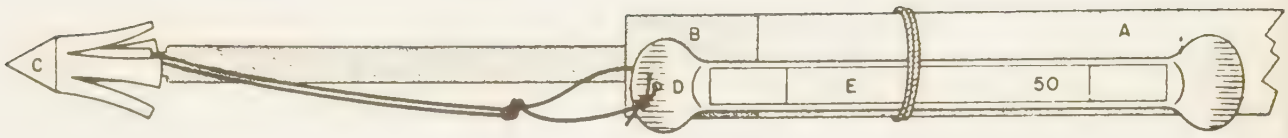
Reception Office
Instituto de Investigaciones Pesqueras
Puerto Pesquero
Cádiz, Spain

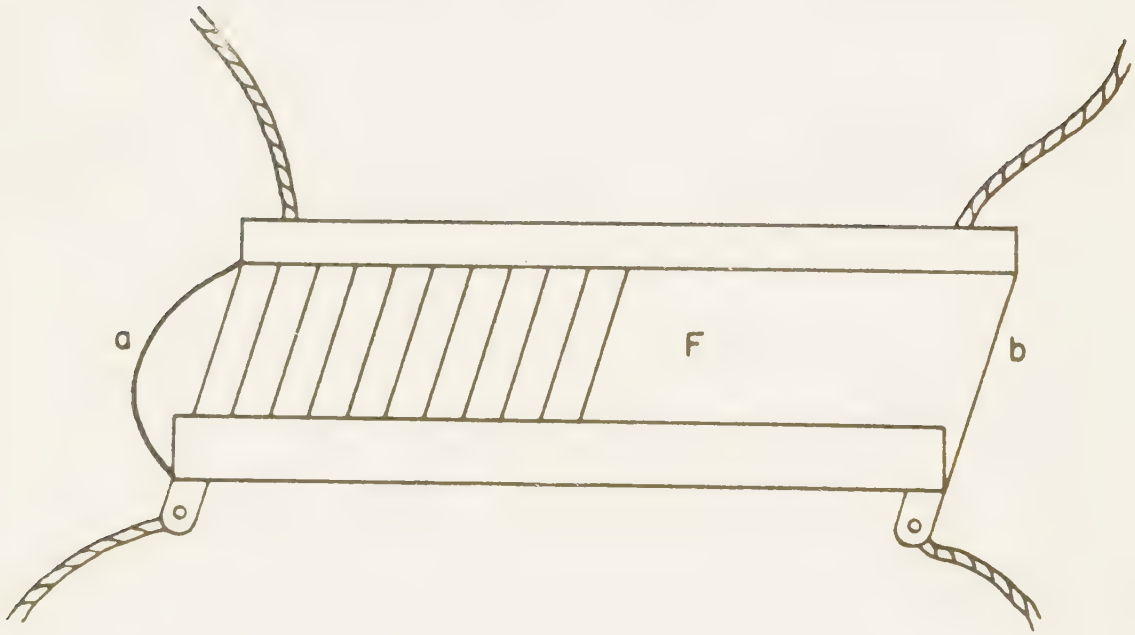
Symbols and serial number known to FAO as at June 1966
Serial no.

MANUFACTURER

Instituto de Investigaciones Pesqueras
Puerto Pesquero
Cádiz, Spain

SPECIES MARKED
Thunnus thynnus


C
B
A
D
E
50


a
F
b

FRs

TUNA MARKING PROGRAMS

COUNTRY : Spain

54201

TITLE OF INSTITUTION : Instituto de Investigaciones Pesqueras
Puerto Pesquero
Cádiz, Spain

TITLE OF PROGRAM: Marcación de Atunes

Current: Summer

Projected: If possible every year, although not sequent

Estimated annual cost: -

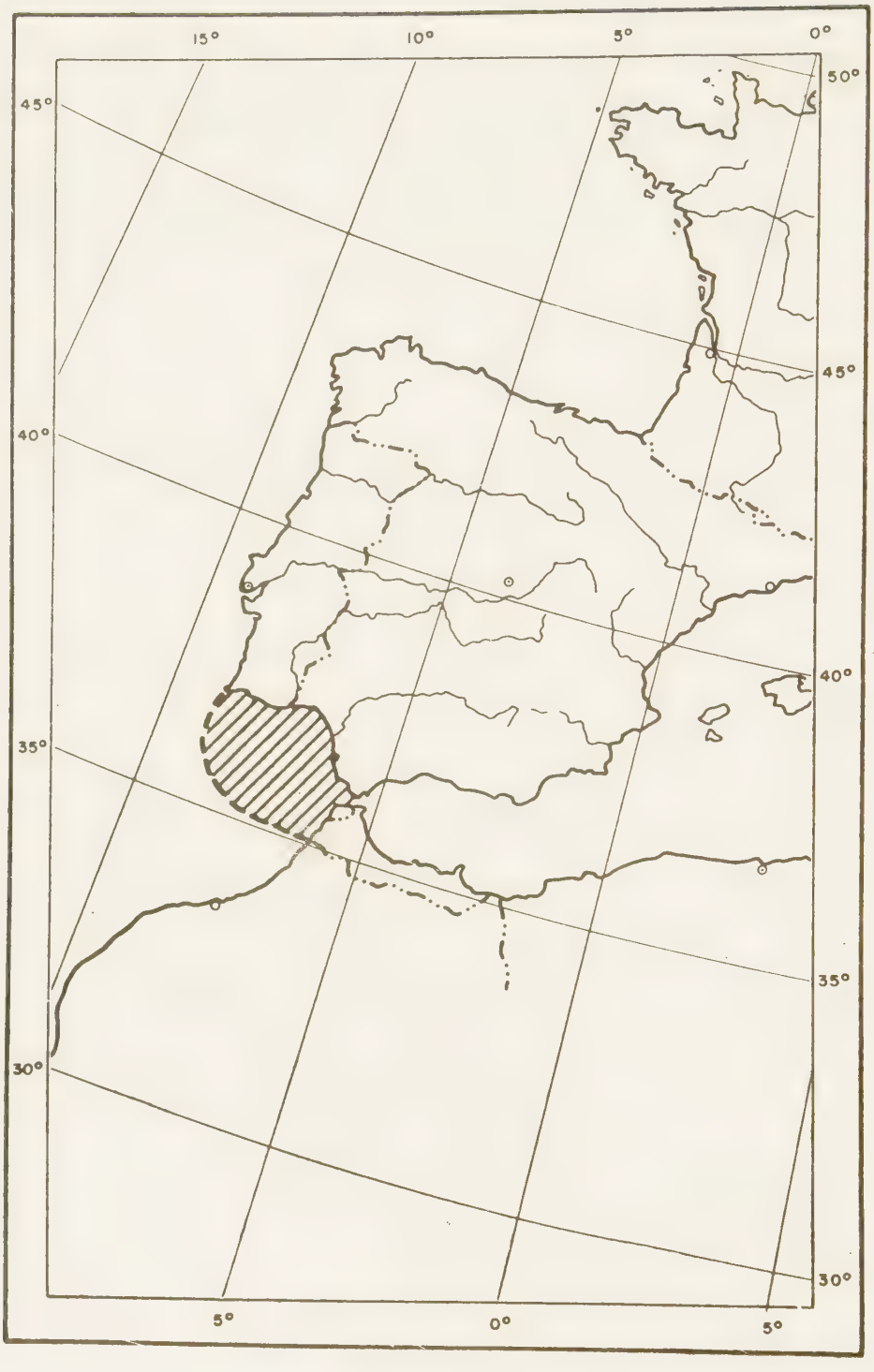
Sponsoring body(ies): -

Area of Marking: Gulf of Cadiz

- See figure overleaf -

SUBJECT MATTER STUDIED

SPECIES STUDIED
Thunnus thynnus



Coverage of present marking program

FRs

TUNA MARKS

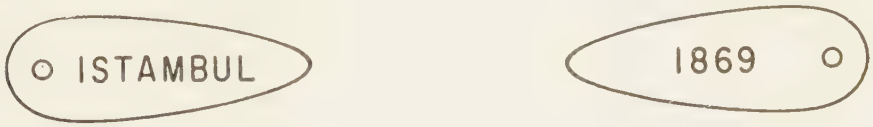
COUNTRY : Turkey

55601

TITLE OF INSTITUTION : Hydrobiological Research Institute, Faculty of Science
University of Istanbul
Istanbul

DESCRIPTION

An almond-shaped red alkathene plate attached by a spun nylon thread. The tag has a serial number and the city (Istanbul) where the laboratory is situated stamped on it by heat process.



Sarda sarda

APPLICATION

Attached by darning needle in front of the first dorsal fin.

METHOD OF HANDLING

Fish are held in wooden trough about 2 m long with base line for snout and 10 cm intervals marked. The trough is hung by hawsers over the side of the vessel.

RECOVERY, REPORTING AND RETURN

Publicity
Visual methods

Scale of Reward
US$ 1

Reception Offices
Hydrobiological Research Institute
Rumelihisar, Istanbul

Symbols and serial number known to FAO as at June 1966
Serial no. and city

MANUFACTURER

SPECIES MARKED

FRs

TUNA MARKING PROGRAMS

55601

COUNTRY : Turkey

TITLE OF INSTITUTION : Hydrobiological Research Institute
Istanbul
Turkey

SPECIES STUDIED

Sarda sarda

TITLE OF PROGRAM: Fisheries Biological Investigations of the Commercial Important Fishes of Turkish waters

Current: From 1955 onwards

Projected:

Estimated annual cost: 1,000 US dollars (approx.)

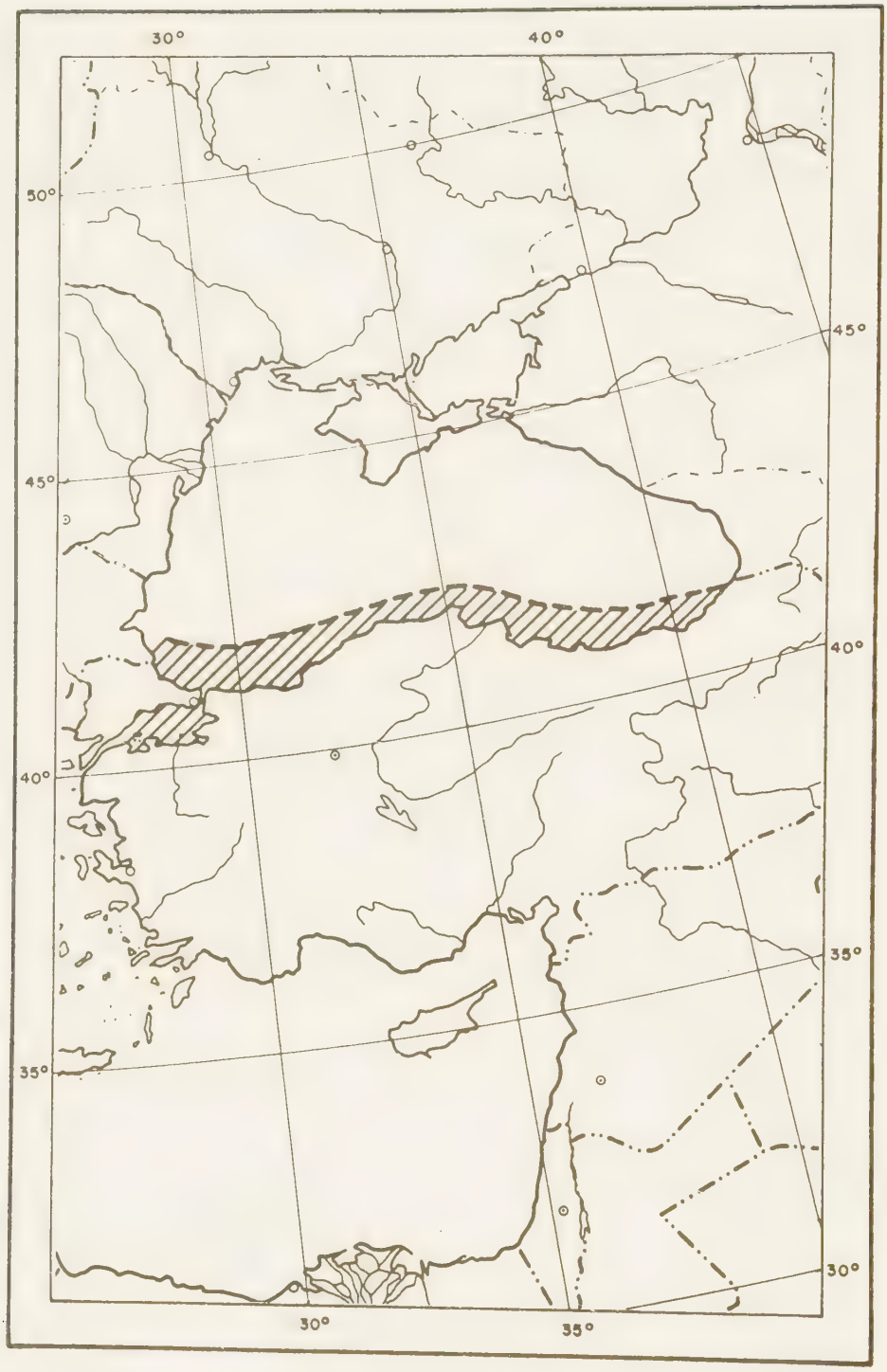
Sponsoring body(ies): Ministry of Commerce

Area of Marking: Black Sea, Bosphorus, Sea of Marmara and Dardanelles

- See figure overleaf -

SUBJECT MATTER STUDIED

Sarda sarda : Estimation of mixing, dispersal and migration, and stock identification
Estimation of population size and mortality rates



Coverage of present marking program

FRs

TUNA MARKS

COUNTRY : U.S.A. 23201

TITLE OF INSTITUTION : California Department of Fish and Game, Marine Resources Operations
California State Fisheries Laboratory, 511 Tuna Street
Terminal Island Station, San Pedro, California

DESCRIPTION

A dart tag, made of 12 cm of yellow plastic tubing, with moulded nylon dart-head inserted and glued into one end. It bears a legend in black.

APPLICATION

Applicator is made of stainless steel tubing: ID 0.118, OD 0.148; 6" in length. Applicator with its enclosed dart tag is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

Plastic foam pads - firm: 2" x 24" x 45". Base line for snout and 10 cm intervals marked by alternating colours, 5 cm intervals also indicated.

RECOVERY, REPORTING AND RETURN

Publicity
Visual methods
Direct correspondence/circular letters

Scale of Reward
$1.00 (+ letter)

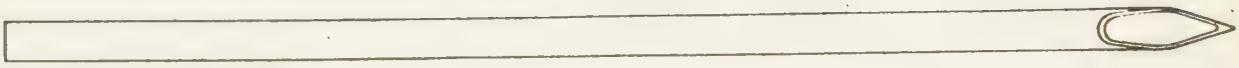
Reception Office
Any Department of Fish and Game office throughout the State for transmittal to the California State Fisheries Laboratory, San Pedro, California.

Symbols and serial number known to FAO as at June 1966
RETURN FISH + GAME SAN PEDRO CALIF.

MANUFACTURER

California Department of Fish and Game

SPECIES MARKED
Thunnus thynnus



FRs

TUNA MARKING PROGRAMS

COUNTRY :

23201

TITLE OF INSTITUTION : California Department of Fish and Game -
Marine Resource Operations
California State Fisheries Laboratory, 511 Tuna Street
Terminal Island Station, San Pedro, California

TITLE OF PROGRAM: Bluefin tuna tag release and recapture

Current: Initiated in 1962; a few released incidentally prior to 1962.

Projected: Indefinitely

Estimated annual cost: $4000 to $35000

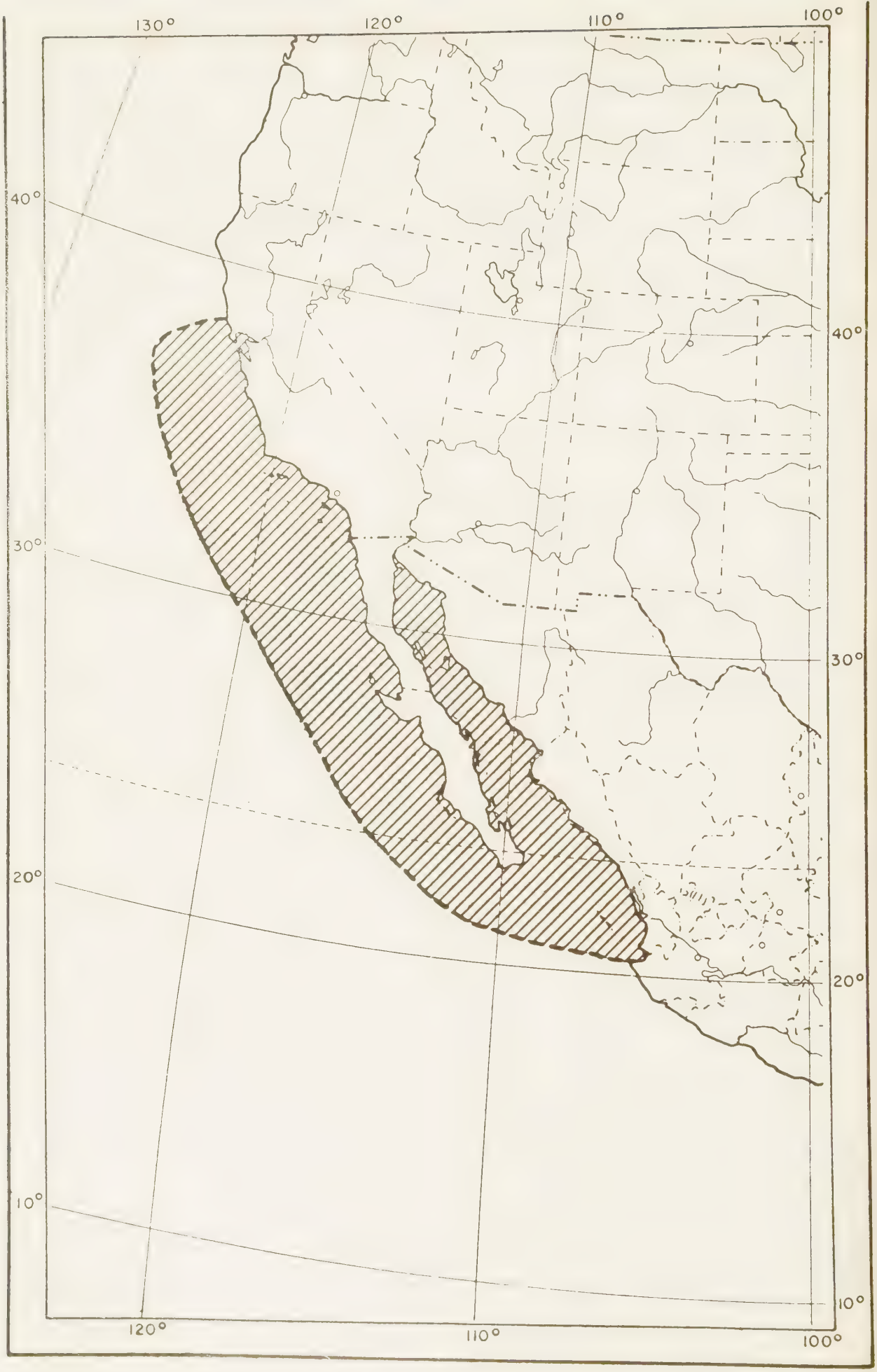
Sponsoring body(ies): California Department of Fish and Game, and U.S. Bureau of Commercial Fisheries

Area of Marking: Temperate Eastern Pacific Ocean - off southern California and Baja California

- See figure overleaf -

SUBJECT MATTER STUDIED: Thunnus thynnus :
- Estimation of mixing, dispersal and migration.
- Estimation of population size and mortality rates.
- Estimation of growth.

SPECIES STUDIED
Thunnus thynnus



Coverage of present marking program

FRs

TUNA MARKS

COUNTRY : U.S.A.

23201

TITLE OF INSTITUTION : California Department of Fish and Game, Marine Resources Operations
California State Fisheries Laboratory, 511 Tuna Street
Terminal Island Station, San Pedro, California

DESCRIPTION

A dart tag, made of 10½ cm of yellow plastic tubing, with moulded nylon dart-head inserted and glued into one end. It is serially numbered with a letter symbol and five-digit number in black, followed by the legend.

APPLICATION

Applicator is made of stainless steel tubing: ID 0.135, OD 0.165; 6" in length. Applicator with its enclosed dart tag is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

Plastic foam pads - firm: 2" x 24" x 45". Base line for snout and 10 cm intervals marked by alternating colours, 5 cm intervals also indicated.

Thunnus alalunga

RECOVERY, REPORTING AND RETURN

Publicity

Visual methods
Direct correspondence/circular letters

Scale of Reward

$1.00 (+ letter and commendation card)

Reception Office

Any Department of Fish and Game office throughout the State for transmittal to the California State Fisheries Laboratory, San Pedro, California.

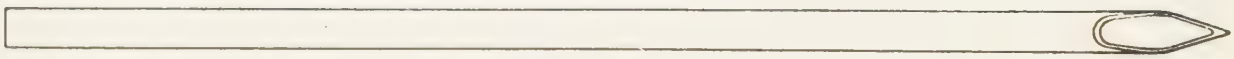
Symbols and serial number known to FAO as at June 1966

Serial no. RETURN CAL. F+G SAN PEDRO

SPECIES MARKED

MANUFACTURER

Floy Tag and Mfg. Co. Inc.
2909 N.E. Blakeley Street
Seattle 5, Washington



FRs

TUNA MARKING PROGRAMS

COUNTRY : U.S.A.

23201

TITLE OF INSTITUTION : California Department of Fish and Game -
Marine Resource Operations
California State Fisheries Laboratory, 511 Tuna Street
Terminal Island Station, San Pedro, California

SPECIES STUDIED: Thunnus alalunga

TITLE OF PROGRAM: Albacore tag release and recapture

Current: Since 1952

Projected: Indefinite

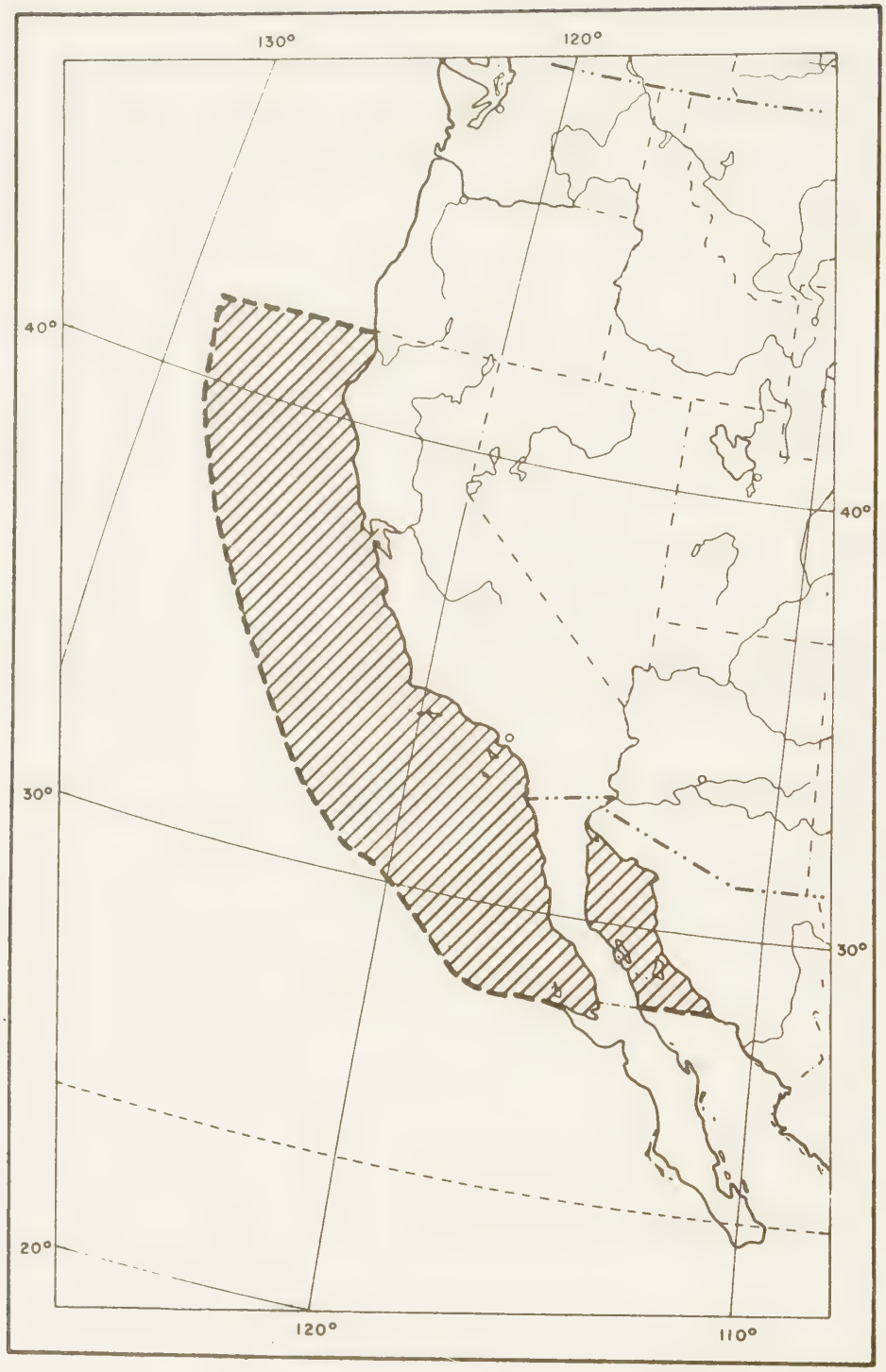
Estimated annual cost: $2000 to $5000

Sponsoring body(ies): California Department of Fish and Game

Area of Marking: Temperate Eastern Pacific Ocean off California and northern Baja California

- See figure overleaf -

SUBJECT MATTER STUDIED: Thunnus alalunga : Estimation of mixing, dispersal and migration.
Estimation of population size and mortality rates.
Estimation of growth.



Coverage of present marking program

FRs

TUNA MARKS

COUNTRY : U.S.A.

23202

TITLE OF INSTITUTION : Inter-American Tropical Tuna Commission
c/o Scripps Institution of Oceanography
La Jolla, California

DESCRIPTION

A dart tag made of a length of plastic tubing with moulded nylon dart-head inserted and glued into one end. The plastic tubing bears a legend.

SPECIES MARKED

Euthynnus pelamis

APPLICATION

Applicator is made of hollow stainless steel needle with bevelled forward end. Applicator with its enclosed dart-tag is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

Fish are held in a V-shaped cradle made of aluminium alloy. The insides of the cradle are are covered with sponge rubber which is, in turn, covered by plastic sheeting. Inset in one side of the cradle is a meter stick. A tag magazine, to hold 100 tag needles, and dart tags, is bolted to the cradle.

- See figure overleaf -

RECOVERY, REPORTING AND RETURN

Publicity

Visual and audio methods

Scale of Reward

$1.00 for each tag (and one drawing each year for a single $300 prize)

Reception Office

-

Thunnus albacares

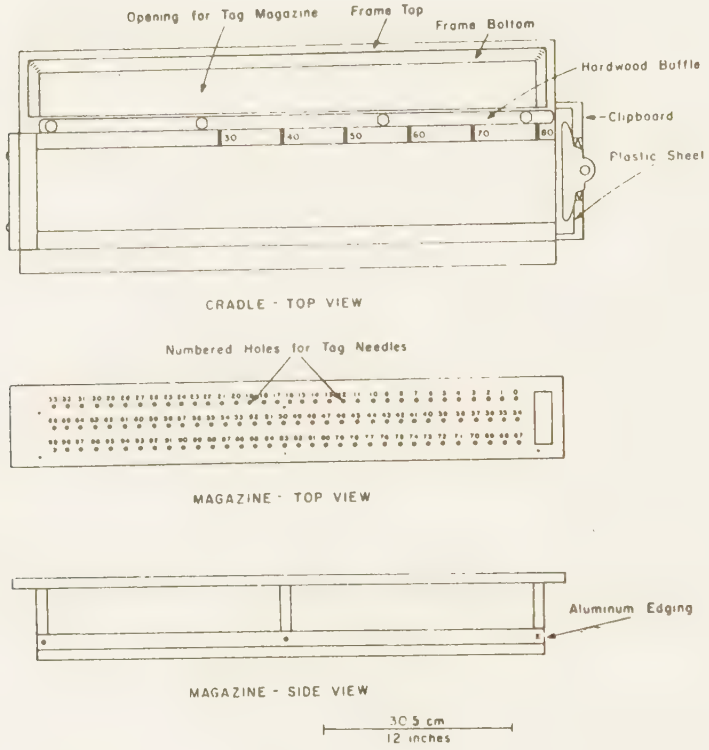
Symbols and serial number known to FAO as at June 1966

Return TUNACOM San Diego

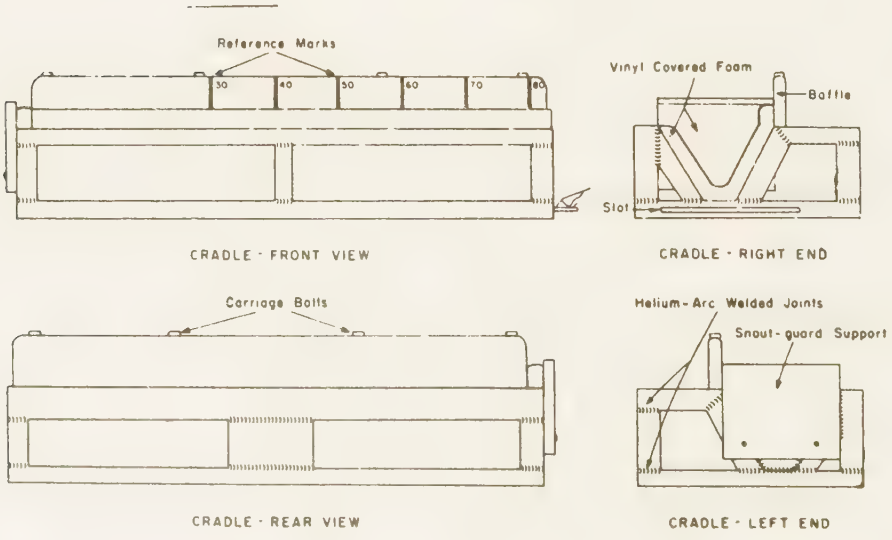
MANUFACTURER

Tags are made by the Commission (but almost identical tags are sold by Floy Tag and Mfg. Co., Seattle, Washington).

NEEDLE



Views of the Mark magazine used by the I-ATTC. (Fink, 1965)



Views of the cradle used by the I-ATTC (Fink, 1965)

FRs

TUNA MARKING PROGRAMS

COUNTRY : U.S.A.

23202

TITLE OF INSTITUTION : Inter-American Tropical Tuna Commission
c/o Scripps Institution of Oceanography
La Jolla, California

TITLE OF PROGRAM: Tuna Tagging Investigations

Current: 155 (Dec.) to date

Projected: - at least through June 1968

Estimated annual cost: Range, 1955-65: $20,000 - $100,000

Sponsoring body(ies): Inter-American Tropical Tuna Commission

Area of Marking: Eastern and Central Pacific

- See figure overleaf -

SUBJECT MATTER STUDIED

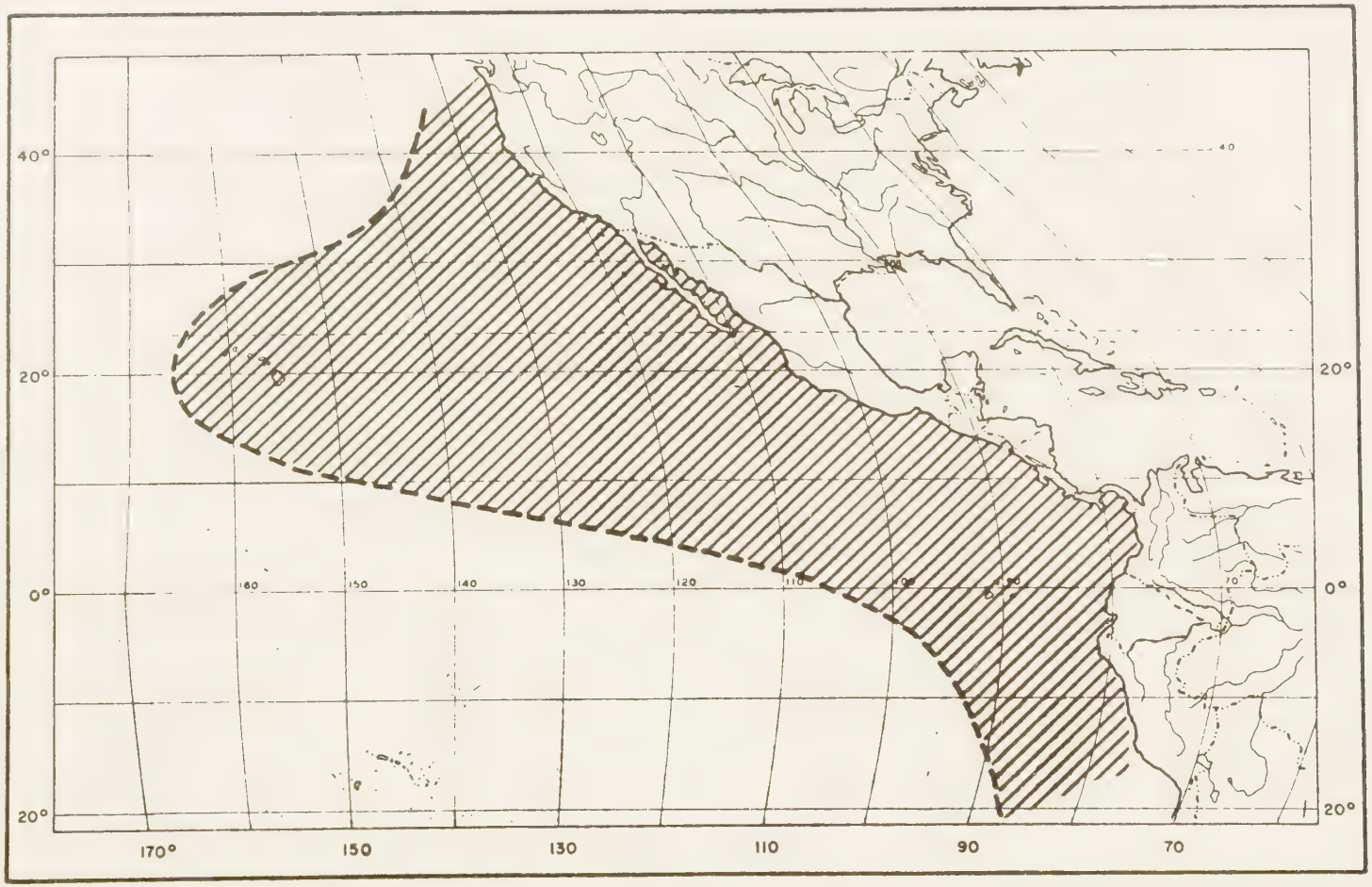
Thunnus albacares : Estimation of mixing, dispersal and migration, and stock identification.
Estimation of population size and mortality rates.
Estimation of growth.

Euthynnus pelamis : - do -

SPECIES STUDIED

Thunnus albacares

Euthynnus pelamis



Coverage of present marking program

FRs

TUNA MARKS

COUNTRY : U.S.A.

23101

TITLE OF INSTITUTION : State of Oregon Fish Commission
307 State Office Building, 1400 S.W. Fifth Avenue
Portland, Oregon 97201

DESCRIPTION

A dart tag, made of 14½ cm of orange plastic tubing, with moulded nylon dart head inserted and glued into one end. It is serially numbered with a letter symbol and a 4-digit number in black, following the legend.

APPLICATION

Tag is applied with a hypodermic needle of proper diameter of stainless steel. Applicator with its enclosed dart tag is inserted diagonally and forward into the fish below the base of the dorsal fin.

- See figure overleaf -

METHOD OF HANDLING

Fish are held in a V-shaped trough made of plywood. The insides of the trough are lined with sponge rubber. The rubber is covered with plastic sheeting. Inset in one side of the trough is a meter stick.

- See figure overleaf -

Thunnus alalunga

RECOVERY, REPORTING AND RETURN

Publicity
Visual methods

Scale of Reward
$1.00 per tag

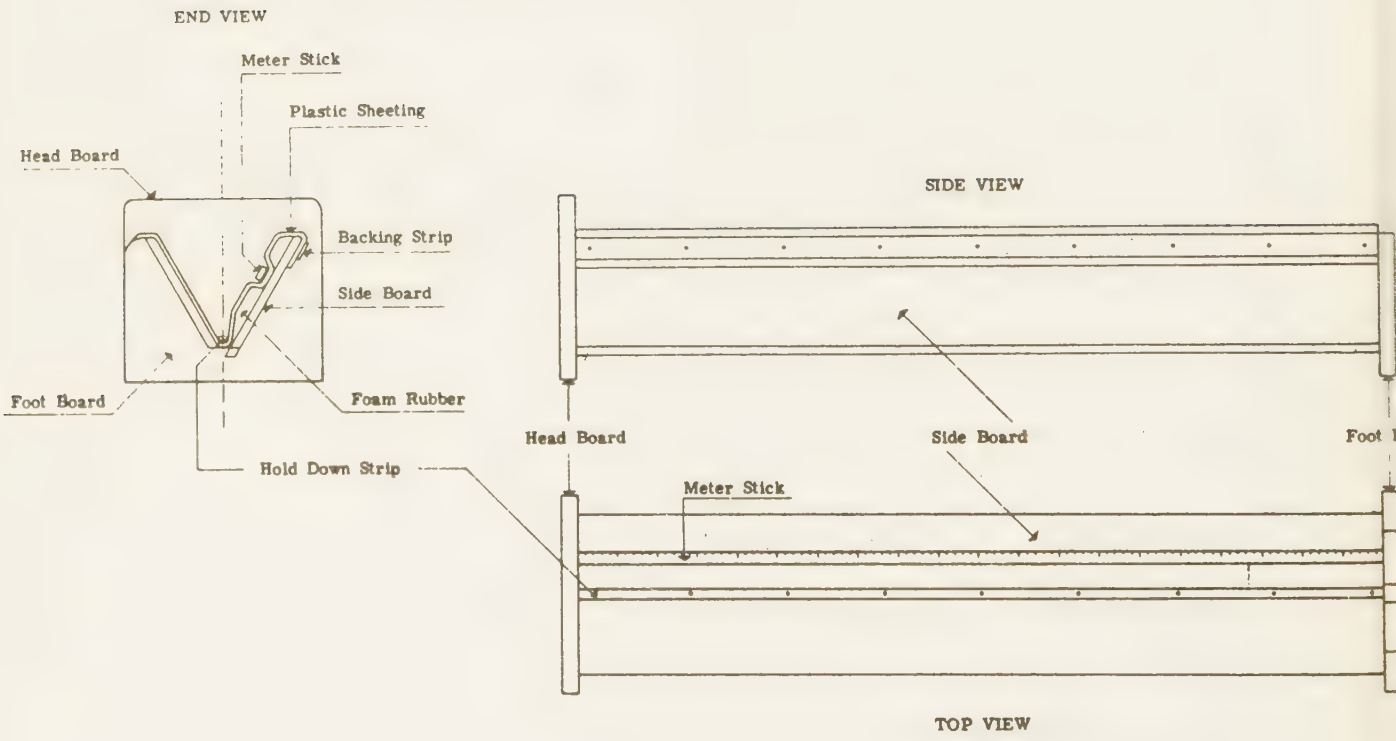
Reception Office
State of Oregon Fish Commission
859 Olney Avenue
Astoria, Oregon 97103

Symbols and serial number known to FAO as at June 1966
REWARD RETURN OREGON FISH COMM. ASTORIA, Letter, serial no.

SPECIES MARKED

MANUFACTURER

Floy Tag and Mfg. Inc.
2909 Blakeley Street
Seattle 5, Washington


END VIEW
Meter Stick
Plastic Sheeting
Head Board
Backing Strip
Side Board
Foam Rubber
Foot Board
Hold Down Strip
SIDE VIEW
Head Board
Side Board
Meter Stick
TOP VIEW

FRs

TUNA MARKING PROGRAMS

COUNTRY : U.S.A.

23101

TITLE OF INSTITUTION : State of Oregon Fish Commission
307 State Office Building, 1400 S.W. Fifth Avenue
Portland, Oregon

TITLE OF PROGRAM: Pre-season Albacore Exploratory Cruise

Current:

Projected: July 1966

Estimated annual cost: $2,500.00

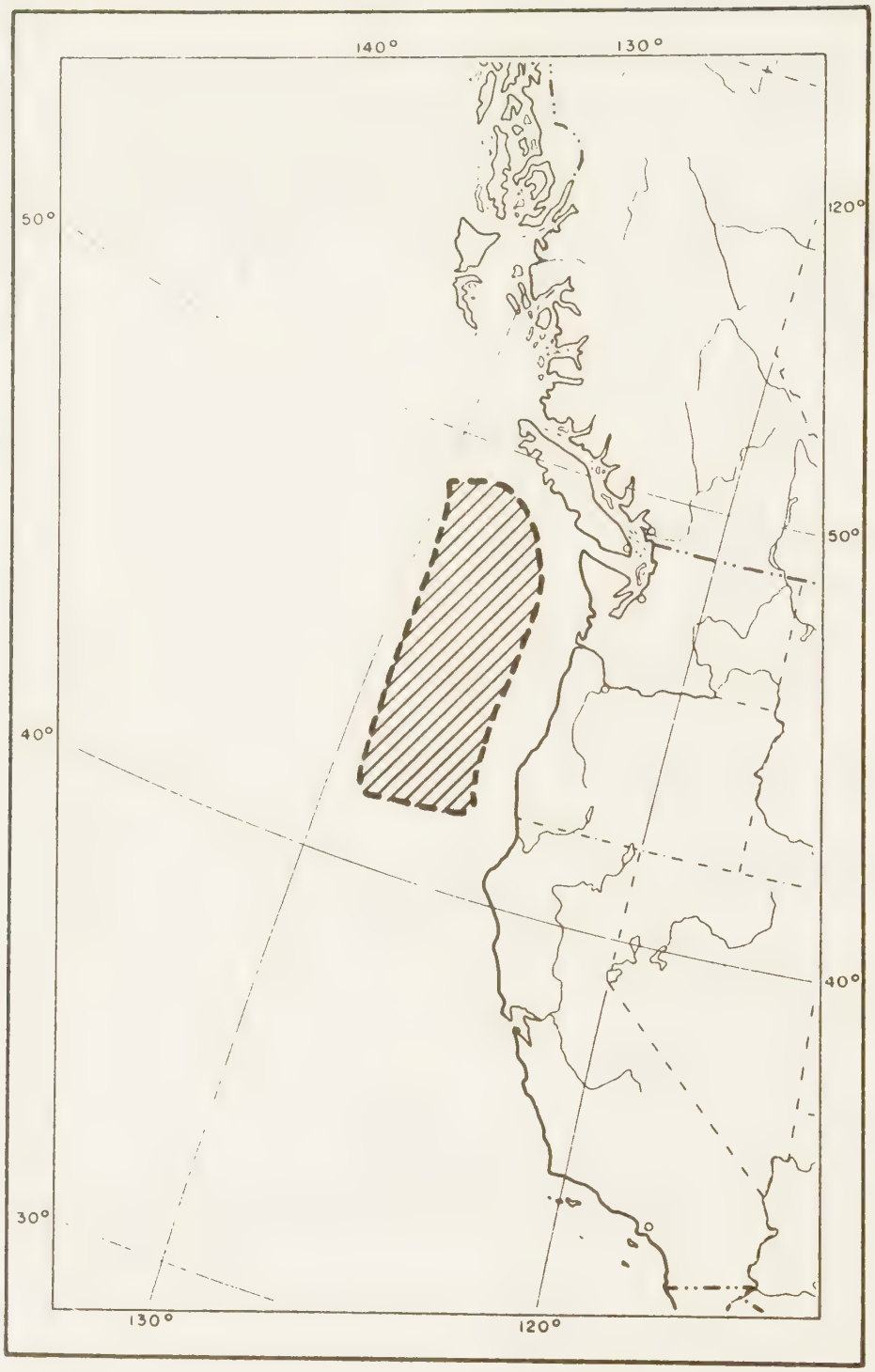
Sponsoring body(ies): State of Oregon Fish Commission

Area of Marking: 40 to 120 miles off the Oregon coast

- See figure overleaf -

SPECIES STUDIED: Thunnus alalunga

SUBJECT MATTER STUDIED: Thunnus alalunga : Estimation of mixing, dispersal and migration.
Estimation of growth.



Coverage of present marking program

FRs

TUNA MARKS

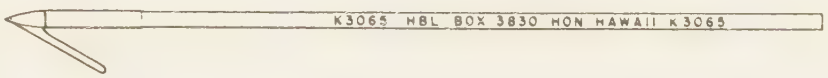
66001

COUNTRY : U.S.A.

TITLE OF INSTITUTION : U.S. Bureau of Commercial Fisheries, Biological Laboratory
P.O. Box 3830
Honolulu, Hawaii 96812

DESCRIPTION

A dart tag made of 12 cm. of yellow plastic tubing, with moulded nylon dart head inserted and glued into one end. It is serially numbered with a letter symbol and 4-digit number, followed by a legend, printed in black.



APPLICATION

The tag is inserted with a stainless steel needle made of No. 3 tempered stainless steel 5/32 inch outside diameter and 0.016 inch wall. The point is cut as shown in the figure so the tag head will be held securely. (Without this feature the tip slips out of the groove, the head turns across the axis of the needle, and the streamer is cut off when the needle is inserted into the fish.) The needle should be offsufficient length so that the end of the streamer does not protrude.

- See figure overleaf -

METHOD OF HANDLING

In tagging skipjack, the fish is hooked on pole and line, swung up, caught under the arm, and unhooked. The tagger, standing 1 to 2 feet behind the fisherman, inserts the tag-bearing needle on the right side of the fish, at a point one-half to one inch below the crest of the back and between the end of the second dorsal fin and the insertion of the first dorsal finlet. The tagged fish are not measured. In tagging albacore, yellowfin, and big-eye tunas, the fish is brought up on deck, measured, tagged and released as quickly as possible.

RECOVERY, REPORTING AND RETURN

Publicity
Visual methods and direct correspondence, circular letters

Scale of Reward
Commendation letter, giving purpose of tagging program, area and time of release of the tagged tuna, and some preliminary results of the tagging program.

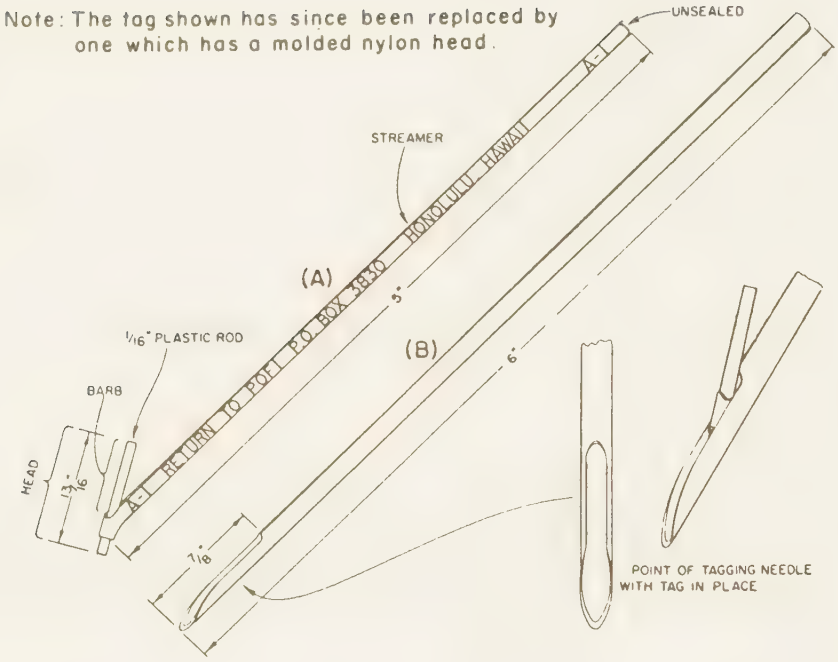
Reception Office
U.S. Bureau of Commercial Fisheries Biological Laboratory
P.O. Box 3830
Honolulu, Hawaii 96812

Symbols and serial number known to FAO as at June 1966
Letter, serial no. HBL BOX 3830 HON HAWAII

MANUFACTURER

Floy Tag and Mfg. Inc.
2909 N.E. Blakeley Street
Seattle, Washington 98105
U.S.A.

SPECIES MARKED
Thunnus albacares
Thunnus obesus
Thunnus alalunga
Euthynnus pelamis


Note: The tag shown has since been replaced by one which has a molded nylon head.
UNSEALED
STREAMER
A-1
HONOLULU HAWAII
(A)
3"
1/16" PLASTIC ROD
BARB
HEAD
13/16"
A-1 RETURN TO POF I P.O. BOX 3830
(B)
6"
7/16"
POINT OF TAGGING NEEDLE WITH TAG IN PLACE

NO PROGRAM SHEET

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

DEPARTMENT OF FISHERIES
Fishery Resources and
Exploitation Division

QUESTIONNAIRE

TUNA MARKING

1. This part of the FAO Questionnaire on Tuna Marking is designed to obtain data for the preparation of a guide to tuna fish marks used throughout the world.

Please send me:
French version ☐
Spanish version ☐

A. MARKING INSTITUTION

1. *Country* .....
2. *Title of Institution* .....
.....
.....
3. *Address* .....
.....
.....

If institution is international in character, check here ☐

B. TYPE OF MARK

1. *General Nature*
Lea ..... ☐
Disk ..... ☐
Hook ..... ☐
Dart ..... ☐
Spaghetti ..... ☐
Others * ..... ☐

2. *Material*
Metal ..... ☐
Celluloid ..... ☐
Plastic ..... ☐
Other * ..... ☐

3. *Symbols used on Tag*

INT 151-1 1265 200 - 33811

* *Specify*

SAMPLE TAG TO BE FIXED HERE

USE ADHESIVE TAPE

OTE: Briefly describe the mark if no sample can be attached.

C. SPP. OF TUNA MARKED

Bluefin (*Thunnus thynnus*) .....
Yellowfin (*Thunnus albacares*) .....
Bigeye (*Thunnus obesus*) .....
Albacore (*Thunnus alalunga*) .....
Blackfin (*Thunnus atlanticus*) .....
Skipjack (*Euthynnus pelamis*) .....
Common bonito (*Sarda sarda*) .....
False albacore (*Euthynnus alleteratus*) .....

D. APPLICATION OF MARK AND METHOD OF HANDLING

1. ***Describe, with figures, implements used for applying marks***

2. ***Describe, with figures, implements used for holding the fish during marking operation***

E. RECOVERY, REPORTING AND RETURN OF MARKS

1. *Publicity*

   a. Visual methods (posters, newspapers) ..... ☐

   b. Audio methods (radio, lectures) ..... ☐

   c. Audiovisual methods (television, films) ..... ☐

   d. Direct correspondence or circular letters ..... ☐

2. *Scale of Reward* (in $) .....

   and/or gifts, commendation cards and letters .....

3. *Reception Office(s)* .....
   Title(s) .....
   .....
   .....
   .....

4. *Address(es)* .....
   .....
   .....
   .....
   .....

F. MANUFACTURERS OF MARKS

1. *Marking Institution* ..... ☐

2. *Commercial Firm(s)* ..... ☐
   .....
   .....

   Address(es) .....
   .....
   .....
   .....
   .....

T II. This part of the FAO Questionnaire on Tuna Marking is designed to obtain data for the preparation of an inventory of current and projected marking programs for tunas.

A. TITLE OF MARKING INSTITUTION

.....

.....

B. PROGRAM

1. *Title of Program* .....

.....

.....

a. Current ..... ☐

Period .....

b. Projected ..... ☐

Period .....

c. National ..... ☐

d. Regional ..... ☐

e. International ..... ☐

2. *Estimated annual cost of the program* (in $)

3. *Area of marking*

4. *Sponsoring Bodies*

a. National .....

.....

.....

b. Province, State or Prefecture .....

c. International .....

.....

.....

Int 151-2 1265 400 - 33812

NOTE: *Please fill one form for each program*

C. SUBJECT MATTER STUDIED

1. *Estimation of:*

   a. Mixing, Dispersal and Migration ☐

   b. Stock Identification ☐

2. *Estimation of:*

   Population Size and Mortality Rates ☐

3. *Estimation of:*

   Growth ☐

D. SPECIES STUDIED

	1a	1b	2	3
Bluefin (*Thunnus thynnus*)	☐	☐	☐	☐
Yellowfin (*Thunnus albacares*)	☐	☐	☐	☐
Bigeye (*Thunnus obesus*)	☐	☐	☐	☐
Albacore (*Thunnus alalunga*)	☐	☐	☐	☐
Blackfin (*Thunnus atlanticus*)	☐	☐	☐	☐
Skipjack (*Euthynnus pelamis*)	☐	☐	☐	☐
Common bonito (*Sarda sarda*)	☐	☐	☐	☐
False albacore (*Euthynnus alleteratus*)	☐	☐	☐	☐

NOTE: Mark appropriate square according to subject matters studied (see C. above)

E. ADDITIONAL INFORMATION AND COMMENTS

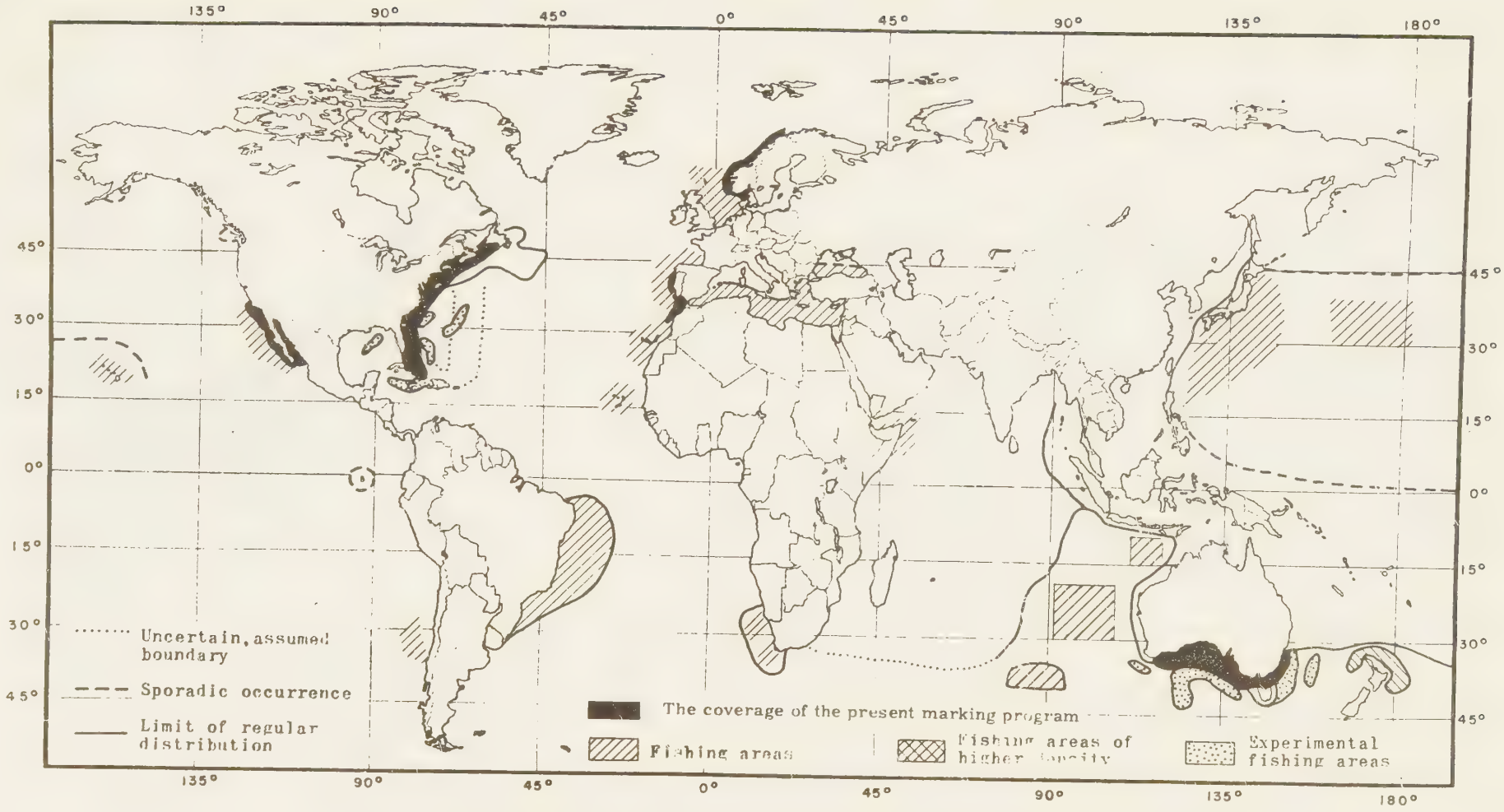


Fig. 1 Distribution and fishing areas of bluefin tunas Thunnus thynnus and T. tonggol

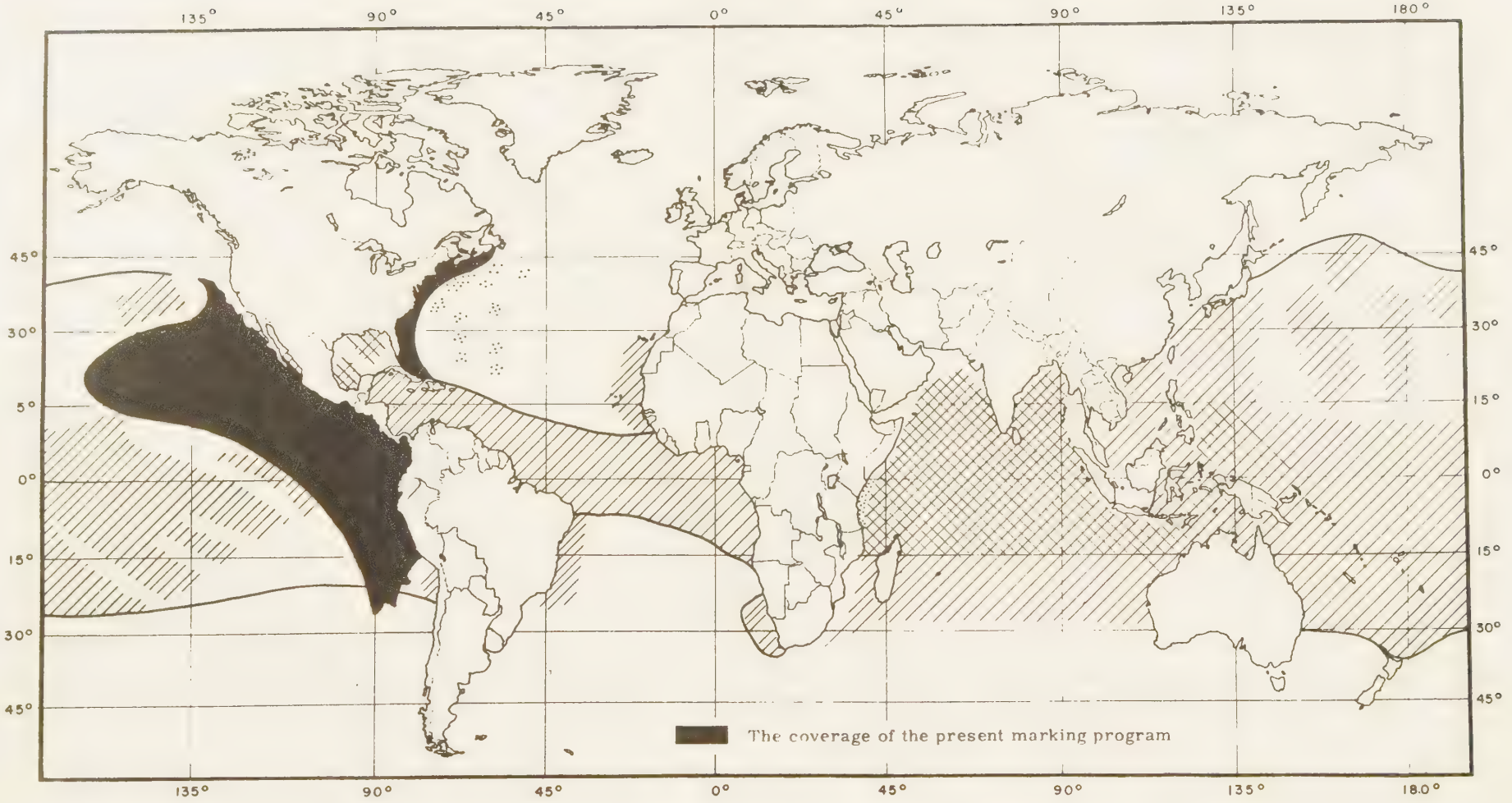


Fig. 2 Distribution and fishing areas of yellowfin tuna Thunnus albacares

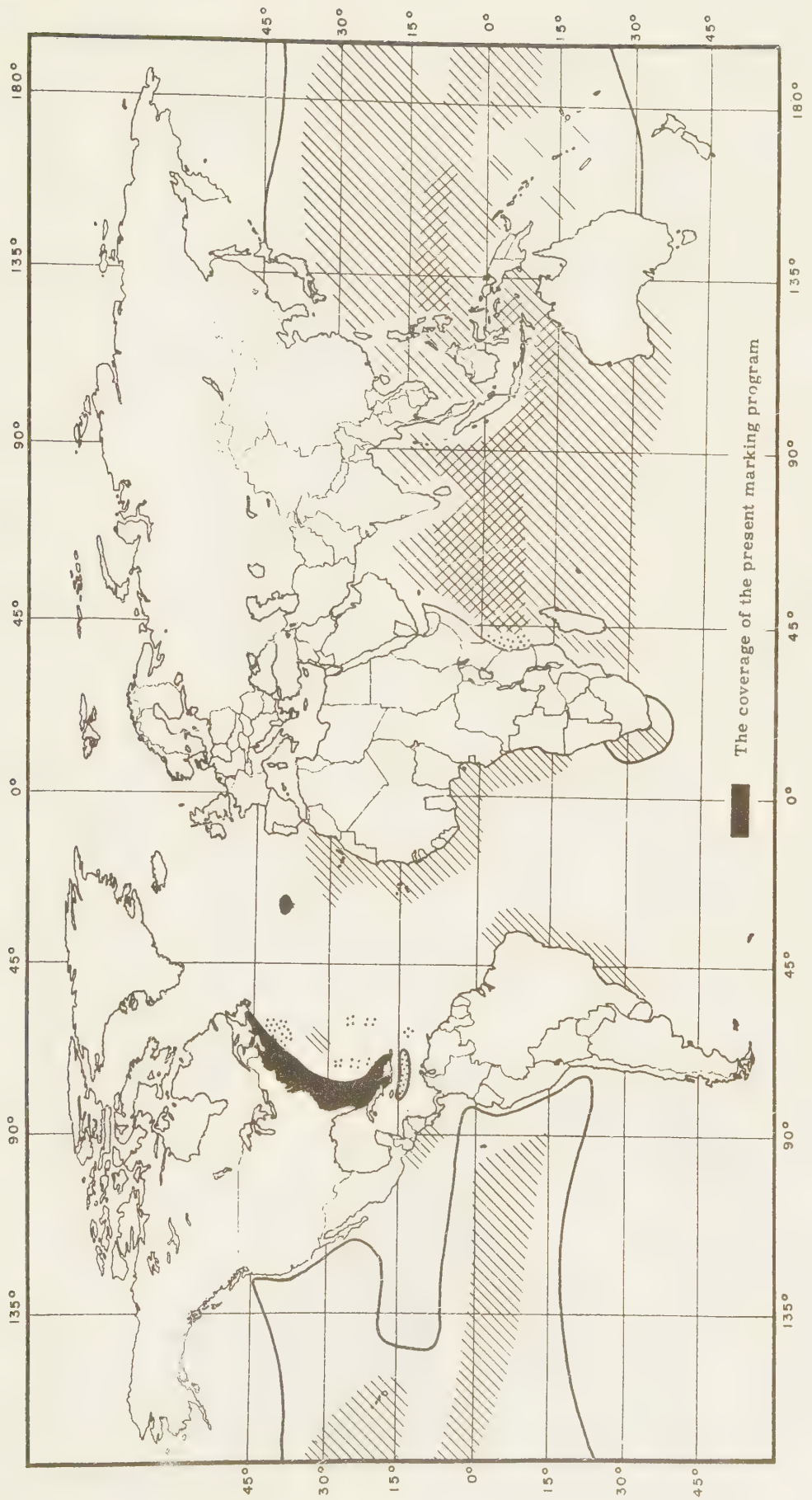


Fig. 3 Distribution and fishing areas of bigeye tuna Thunnus obesus

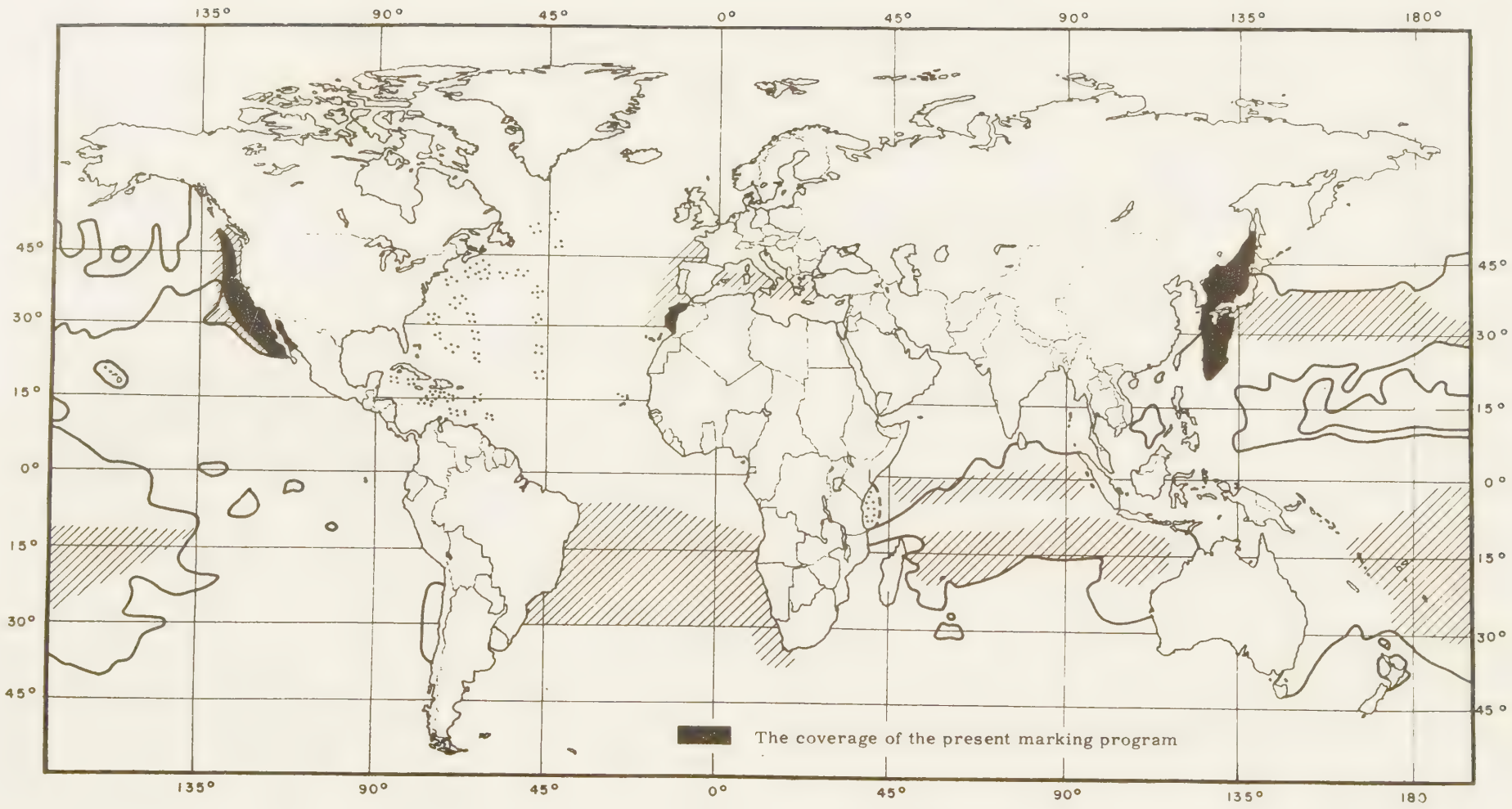


Fig. 4 Distribution and fishing areas of albacore Thunnus alalunga

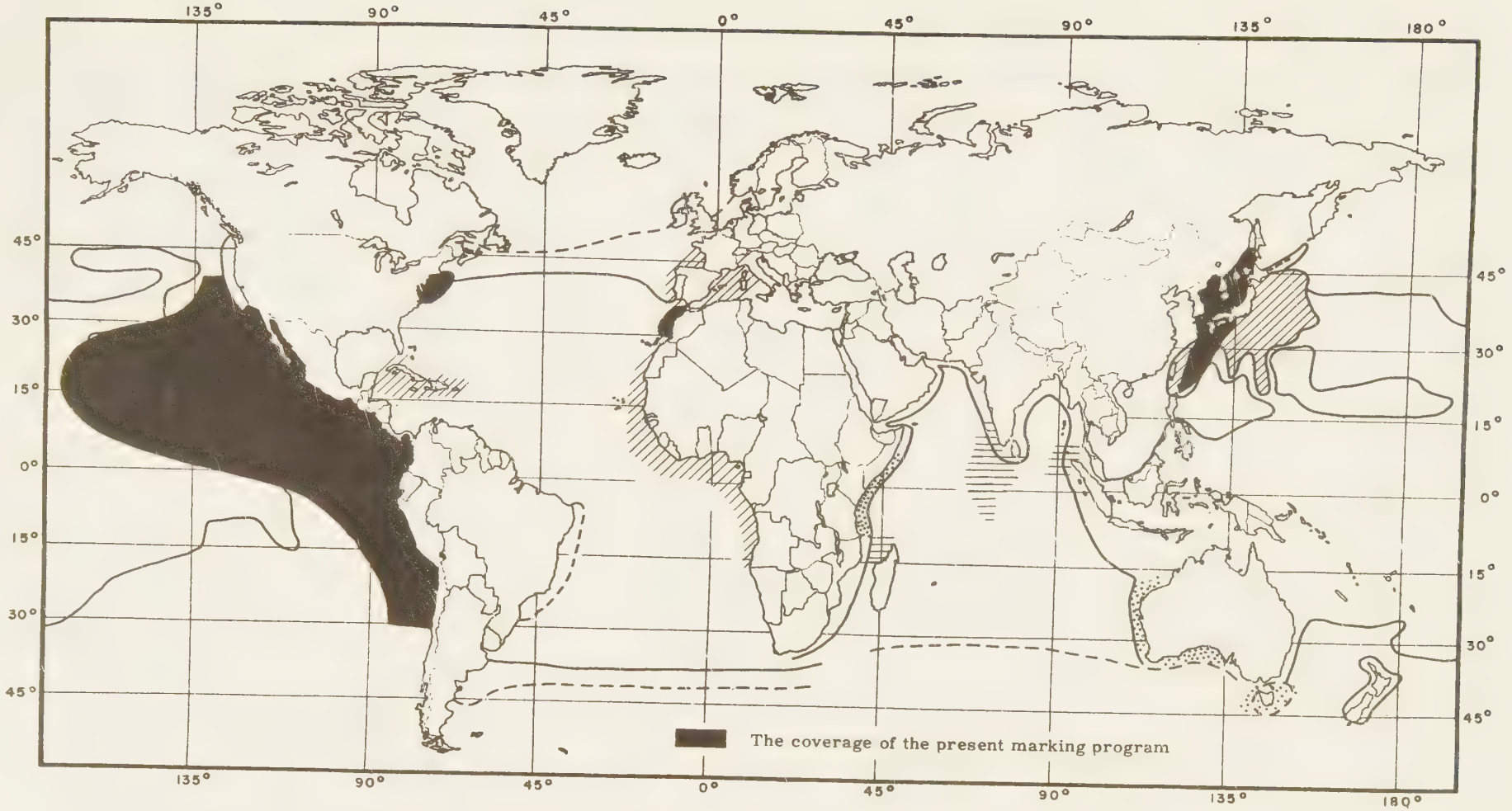


Fig. 5 Distribution and fishing areas of skipjack Euthynnus pelamis

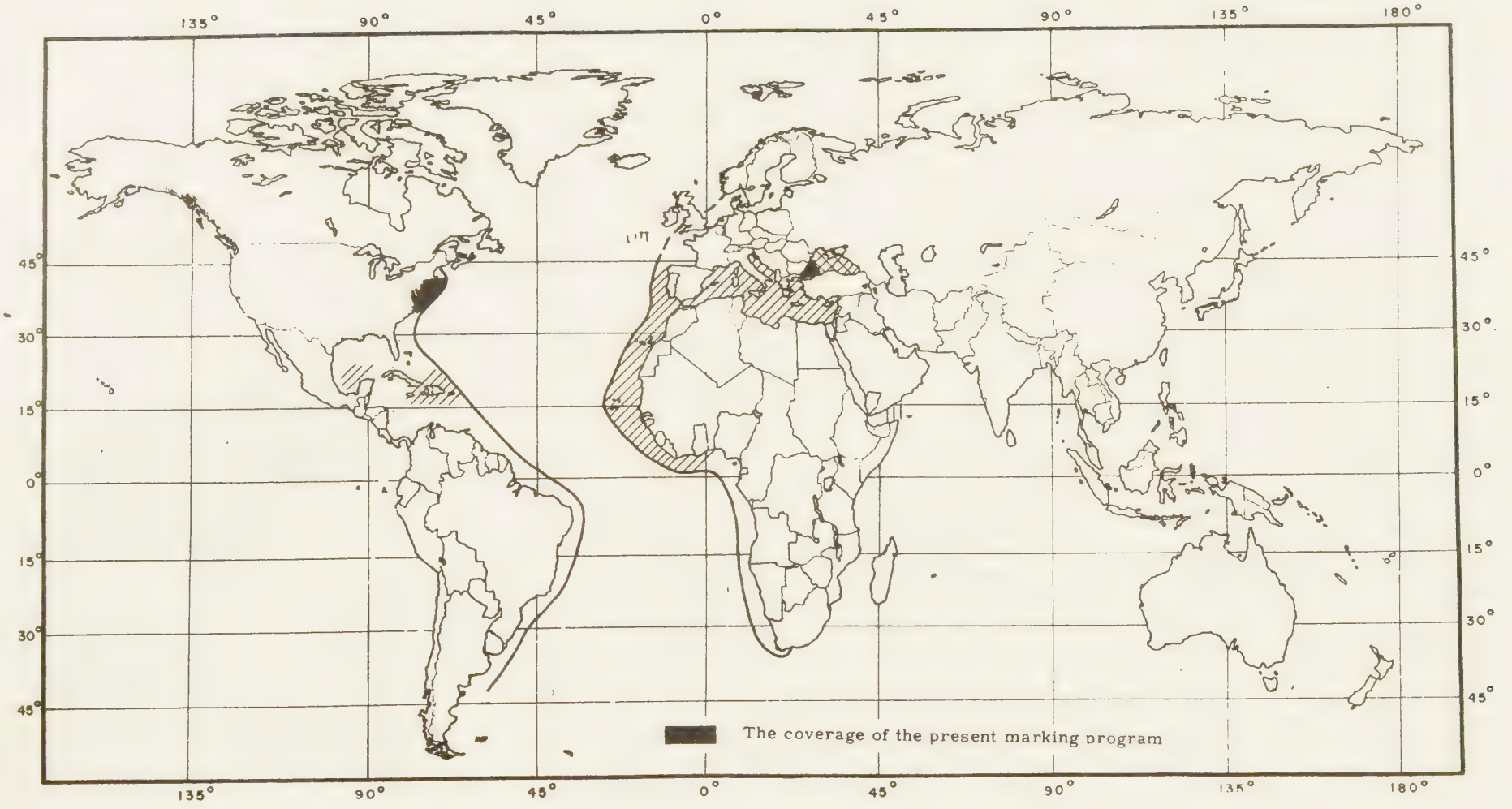


Fig. 6 Distribution and fishing areas of bonitos Sarda sarda

LIST OF MARK MANUFACTURERS

AUSTRALIA

Arthur E. King and Co. (darts)
Rear 135 King Street
Newton, Sydney, N.S.W.

Plastic Accessories Pty. Ltd. (streamers)
24 Bowden Street
Alexandria
Sydney, N.S.W.

JAPAN

Mie Prefectural Fishery Experimental Station
Hamajima-cho
Shima-Gun, Mie-ken

Takano-seisakujo
22 Nijyudaibashi-dori
Kochi-shi

NORWAY

Institute of Marine Research
Bergen

Norsk Plastic A/S
Fredrikstad

SPAIN

Instituto de Investigaciones Pesqueras
Puerto Pesquero, Cadiz

U.S.A.

California Department of Fish and Game
California State Fisheries Laboratory
511 Tuna Street, Terminal Island Station
San Pedro

Floy Tag Manufacturing Co.
2909 N.E. Blakeley Street
Seattle 5, Washington, D.C.

INSUL-TAB Co. Inc.
160 Cross Street
Winchester, Mass.

F.C. Philips Inc. (darts)
Stoughton, Mass.

Pilgrim Plastic Co. (messages)
278 Babcock Street
Boston, Mass. 02715

LIST OF PRINCIPAL OFFICES FOR RECEIVING PARTICULARS OF MARKS AND MARKED FISH

AUSTRALIA

C.S.I.R.O., P.O. Box 21, Cronulla, N.S.W.

" Field Office, c/o Kraft Cannery, Eden, N.S.W.

" Field Office, Tasman Terrace, Port Lincoln, S.A.

Any State Fisheries Inspector

CANADA

Fisheries Research Board of Canada
Biological Station, St. Andrews, N.B.

Any Office of Minister of Fisheries

ITALY

Centro Sperimentale per l'Industria della Pesca, Sezione Scientifica
Via Garibaldi 136, Messina

JAPAN

Mie Prefectural Fishery Experimental Station
Hamajima-cho, Shima-Gun, Mie-ken

Nankai Regional Fisheries Research Laboratory, Fishery Agency
Japanese Government
6-chome, Sanbashi-dori, Kochi-shi

MOROCCO

Institut des Pêches Maritimes
Rue de Tiznit, Casablanca

NORWAY

Fiskeridirectoratets
Bergen

PORTUGAL

Instituto de Biologia Maritima
Cais do Sodré, Lisbon

SPAIN

Instituto de Investigaciones Pesqueras
Puerto Pesquero, Cadiz

TURKEY

Hydrobiological Research Institute
Rumelihisar, Istanbul

U.S.A.

Any Department of Fish and Game in State of California

State of Oregon Fish Commission
859 Olney Avenue, Astoria, Oregon 97103

US Bureau of Commercial Fisheries, Biological Laboratory
P.O. Box 3830, Honolulu, Hawaii 96812

LIST OF DISTINGUISHING SYMBOLS FOUND ON TUNA FISH MARKS

Symbol	Institute	Page
I.P.M.M.	Institut des Pêches Maritimes Casablanca, Morocco	33
ISTANBUL	Hydrobiological Research Institute Rumelihisar, Istanbul, Turkey	53

TAXONOMIC INDEX

Species	Pages	Sheets
Euthynnus pelamis	5-16	21701
	21-24	45101
	25-28	45102
	29-32	45103
	33-36	11301
	65-68	23202
	73-75	66001
Sarda sarda	5-16	21701
	53-56	55601
Thunnus albacares	5-16	21701
	25-28	45102
	29-32	45103
	65-68	23202
	73-75	66001
Thunnus alalunga	17-20	54301
	21-24	45101
	25-28	45102
	29-32	45103
	33-36	11301
	57-64	23201
	69-72	23101
	73-75	66001
Thunnus obesus	5-16	21701
	25-28	45102
	29-32	45103
	43-46	54101
	73-75	66001
Thunnus thynnus	1-4	61501
	5-16	21701
	17-20	54301
	33-36	11301
	37-42	51401
	43-46	54101
	47-52	54201
	57-64	23201

REFERENCES

Fink, B.D., 1965 A technique, and the equipment used, for tagging tunas caught by the pole and line method. J.Cons., 29(3):335-9

Laevastu, T. and H. Rosa, Jr., 1963 Distribution and relative abundance of tunas in relation to their environment. FAO Fish.Rep., (6)vol.3:1835 - 51

Rodríguez-Roda, J., 1964 Biología del atún, Thunnus thynnus (L.), de la costa sudatlántica de España. Invest.pesqu., 25:33-146